SITE CHARACTERIZATION REPORT

For the West Plant Site, Superior, Arizona

REPORT

Submitted To: Resolution Copper Mining LLC
Casey Mckeon
102 Magma Heights
Superior, Arizona 85273

Submitted By: Golder Associates Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052 USA

Distribution:
3 hard copies and 3 CDs - ADEQ, Danielle Taber
1 hard copy and 1 CD - RCML, Dr. Casey McKeon
3 hard copies with CDs - Golder

December 2011

Project No. 073-92519-02

A world of capabilities delivered locally

Golder Associates

EXECUTIVE SUMMARY

The purpose of this Site Characterization Report is to provide a summary of existing relevant environmental data to characterize smelter affected soil at the West Plant Site, and to evaluate that data for use in the development of human health risk-based site-specific soil remediation standards (SSSRLs) for the West Plant Site.

Portions of the West Plant Site, operated by Resolution Copper Mining LLC (RCML), include smelter-affected soil surrounding a historical smelter stack that operated from 1924 to 1972 near the town of Superior, Arizona (Figure 1-1). RCML proposes to remediate the smelter-affected soil to risk-based SSSRLs), in accordance with Arizona Administrative Code (AAC) R18-7-206, under the regulatory authority of the Arizona Department of Environmental Quality (ADEQ) Voluntary Remediation Program (VRP). This Site Characterization Report provides a summary of the relevant environmental data available for the site, and a proposed approach for a human health risk evaluation to be used to develop the SSSRLs.

Smelter-affected soil at the West Plant Site was previously regulated under RCML's Area-wide Aquifer Protection Permit (APP) No. P-101703 administered by ADEQ. RCML elected to switch regulatory authority for smelter-affected soil from APP to VRP in 2010. The APP permit continues to play a relevant role in the remediation process because some of the soil slated for removal within the West Plant Site will be used as fill in some of the facilities included in the APP compliance schedule. The APP and VRP programs have agreed to coordinate efforts at the West Plant Site.

The West Plant Site is located in mountainous and rugged terrain with steep slopes, cliff formations, and deeply incised canyons, at elevations between approximately 2,675 feet above mean sea level (amsl) to 3,975 feet amsl. Queen Creek is the primary surface drainage, flowing through the town of Superior, which is adjacent to the property to the south (Figure 1-2). Drainage on the West Plant Site is ephemeral, flowing predominantly from northeast to southwest. The entire West Plant Site, except for Silver King Wash, operates under a National Pollution Discharge Elimination System (NPDES) permit, and a Multi-Sector General Permit (MSGP). Runoff from the site is contained by stormwater collection facilities on-site, and pumped back to Tailings Ponds 6 and 7. Silver King Wash, located in the northwest corner of the West Plant Site, is an ephemeral wash that flows to the southwest into Queen Creek.

The West Plant Site is in an arid location, with annual average precipitation of approximately 18 inches. Wind roses for the site indicate predominantly WSW winds in the hotter months, and mostly NNE winds in the cooler months. The soil at the West Plant Site is predominantly aridisols: "developed soils of dry regions". Vegetation in the lower elevation areas is classified as the Arizona Upland subdivision of the Sonoran Desert, and the upper elevation vegetation is transitional to the Interior Chaparral classification.

The current and foreseeable future land use at the West Plant Site has been identified by RCML as industrial. The West Plant Site is a working minesite, and workers in this area operate under Mine Safety and Health Administration (MSHA) rules that require workers to be trained in safe work practices to reduce or eliminate exposures to health or safety hazards.

Four datasets were evaluated for risk evaluation purposes. The first and largest dataset was developed in 1998 by Brown and Caldwell Inc. (B&C) for BHP-Billiton (Broken Hill Propriety-Billiton), the former owner of the West Plant Site. The other datasets were developed by Golder Associates Inc. (Golder) in 2001, February 2008, and February 2009 on behalf of RCML, the current owner of the West Plant Site. In addition, another Golder dataset for future remediation planning (April 2008 test pit sampling) was used to a limited extent in this report to evaluate the depth of contamination and the potential for effects to groundwater. The four datasets were comparable in that they represent surface soil (variably from 0 to 2 inches below ground surface) and a less than 250 micrometer (μm) particle size fraction. All data were validated by independent consultants, and the 1998 dataset was the subject of a second quality control report commissioned by RCML in 2007. All data were acceptable for risk evaluation purposes.

The conceptual site model for the West Plant Site concluded that exposure to soil is the main concern for potential human health risk. Exposure to groundwater and surface water is of less concern and is already regulated under other state and federal programs. The elevated constituents in soil (arsenic, copper, and lead) originated largely from particulate emissions from the smelter/roaster stack(s) and fugitive emissions from other mineral processing activities, such as crushing and concentrating. These particulate and fugitive emissions were transported by air and deposited on soil surrounding the source areas. The affected media were soil and air. There are two direct exposure routes for potential human receptors: incidental ingestion of affected soil and dermal contact with affected soil. There is one indirect exposure route for potential human receptors: inhalation of constituents resuspended from affected soil into air. Arsenic, copper, and lead were identified as the constituents of concern (COCs).

The West Plant Site is divided into four land areas for risk evaluation purposes, largely based on contaminant concentrations, topography, and accessibility, as shown in Figure 2-1. Public access in all of the land areas is illegal and restricted. Industrial workers can access all land areas, although the frequency of use varies by the need for access and the ruggedness of the terrain, and on-site exposure is minimal. Illegal trespassers may gain access to some parts of the site, with varying accessibility despite RCML's efforts to prevent trespassing. Based on these parameters, the four land areas were assigned potential receptors and exposure categories for the risk evaluation:

- East Mountain Front Area (EMF) – Access to the EMF is controlled by mine security, and limited access over rugged terrain. Low-level use industrial workers (adults) and low-level use trespassers (teenagers and adults) are evaluated for this area.

- Industrial Area (IA) – The IA is an operating mine site. Public access is actively restricted by mine security and fencing, and is minimal. Regular work shift industrial workers (adults) and low-level use occasional trespassers (teenagers and adults) are evaluated for this area.

- North Mountain Front Area (NMF) – The NMF is located in extremely difficult and treacherous terrain and desert vegetation. Infrequent use industrial workers (adults), and infrequent use trespassers (teenagers to adults) are evaluated for this area.

- Silver King Wash Area (SKW) – This small area is where a wash flows though the northwest corner of the site. The SKW area has few visitors. Occasional visitors include trespassers with all-terrain vehicles. Low-level use industrial workers (adults) and low-level use trespassers (pre-teenagers to adults) are evaluated for this area.

RCML proposes to develop a probabilistic human health risk evaluation to develop risk-based SSSRLs. SSSRLs will be developed for each land area based on the various levels of exposure by the receptors identified for each area.

The probabilistic risk evaluation uses distributions for one or more exposure parameters to calculate exposure. The exposure parameters will be taken from a variety of regulatory guidance documents and studies at similar smelter sites. Detailed information on selected parameter distributions, including the shapes of the distributions, related statistical data, and rationale for selection of the distributions will be presented in a future report. A sensitivity analysis will be performed to identity the most important input variables. The output of the risk evaluation will be probability distributions of soil remediation levels reflecting the probability of risk for cancer and non-cancer health effects. The results of the risk evaluation will be qualified by a discussion of uncertainties associated with the assumptions used in the evaluation.

Table of Contents

List of Tables

List of Figures

List of Appendices (on CD)

ACRONYM AND ABBREVIATION LIST

Acronym	Definition
AAC	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Health Services
amsl	Above mean sea level
APP	Aquifer protection permit
AWQS	Aquifer water quality standards
B&C	Brown & Caldwell
bgs	below ground surface
BHP	Broken Hill Propriety - Billiton
COC	Constituents of concern
EMF	East Mountain Front area
EMPA	Electron microprobe analysis
EPA	U.S. Environmental Protection Agency
Golder	Golder Associates, Inc.
GPL	Groundwater protection level
Gradient	Gradient Corporation
HEAST	Health effects summary tables
IA	Industrial area
ICP/GFAA	Inductively coupled plasma/graphite furnace atomic adsorption
IEUBK	Integrated Exposure Uptake Biokinetic
IRIS	Integrated risk information system
ITSI	Innovative Technical Solutions Inc.
kg	Kilograms
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
mg/kg	Milligrams per kilogram
MSGP	Multi-Sector General Permit
MSHA	Mine Safety and Health Administration
mg/L	Milligrams per liter
NMED	New Mexico Environment Department
NMF	North Mountain Front area
NPDES	National Pollution Discharge Elimination System
ODEQ	Oregon Department of Environmental Quality
PHHRE	Probabilistic human health risk evaluation
ppm	Parts per million
PRG	Preliminary remediation goal
QA/QC	Quality assurance/quality control
QBD	Quality by Design
RBSL	Risk-based screening level
RCML	Resolution Copper Mining LLC
SKW	Silver King Wash area
SPLP	Synthetic precipitation leaching procedure
SRL	Soil remediation level
SSSRL	Site specific soil remediation level
SWPP	Stormwater Pollution Prevention Plan
TMDL	Total daily maximum load
UCL	Upper confidence limit

UCLEGS	University of Colorado Laboratory for Environmental and Geological Studies
µm	Micrometer
VRP	Voluntary Remediation Program
VSP	Visual Sampling Plan
XRF	X-ray fluorescence

1.0 INTRODUCTION

This Site Characterization Report was prepared on behalf of Resolution Copper Mining LLC (RCML) for smelter affected soil at the West Plant Site, Superior, Arizona (Figure 1-1) by Golder Associates Inc. (Golder). Smelter affected soil at the West Plant Site was regulated from 2007 to 2010 under RCML's Area-wide Aquifer Protection Permit (APP) No. P-101703 administered by the Arizona Department of Environmental Quality (ADEQ). In the spring of 2010, RCML elected to switch the regulatory authority of this site to the Voluntary Remediation Program (VRP) within ADEQ. RCML applied to the VRP program in May 2010, and the application was accepted on May 18, 2010.

RCML proposes to develop risk-based site-specific soil remediation levels (SSSRLs), in accordance with Arizona Administrative Code (AAC) R18-7-206, for the smelter affected soils at the West Plant Site. This report provides a summary of the relevant environmental data available for the site, as well as a proposed approach for the human health risk evaluation that will be conducted to develop the SSSRLs.

While the site has moved regulatory authority to the VRP program, the Area-wide APP for the West Plant Site plays a relevant role in the remediation process because some of the soil slated for removal within the West Plant Site will be used as fill in some of the facilities regulated under the Area-wide APP. The APP and VRP programs have agreed to coordinate their efforts at the West Plant Site so that remediated soil will be available in a timely manner for use as fill in select APP facilities.

RCML submitted several documents to ADEQ while operating within the APP permit that presented much of the relevant environmental data collected for the site, and provided preliminary risk evaluations of that data. The primary submittals include a Risk Assessment Work Plan (Golder 2007), a Risk Assessment Report (Golder 2008a), and Corrections to the Risk Assessment Report (Golder 2008b). The corrections submittal was provided per ADEQ request to change the method for calculation of the 95% upper confidence level in the risk equations in the Golder 2008a submittal. The corrections included replacement of all tables, replacement of chapters 7 and 8, and a new Appendix C for the Golder 2008a submittal.

Additional data have been collected since the Golder 2008b submittal to ADEQ. This Site Characterization Report summarizes the previously collected data for the West Plant Site (Appendix A), as well as presents new data collected since the last submittal to APP (Appendices B and C). The combined dataset is evaluated in this report.

1.1 Objective of the Site Characterization Report

The purpose of this Site Characterization Report is to summarize the existing environmental characterization information for the West Plant Site. The data presented in this Site Characterization Report are evaluated for use in the development of risk-based SSSRLs for the West Plant Site.

1.2 Scope of the Site Characterization

The geographic scope of this Site Characterization Report is the West Plant Site (Figure 1-2) located adjacent to the town of Superior, Arizona. The West Plant Site is bounded by the RCML property boundary to the south, west, and north. The eastern boundary was delineated along the north bank of Queen Creek, proceeding upstream until the tunnel on Highway 60 and then northward along the rocky outcrops until the intersecting northern property line.

The technical scope of this Site Characterization Report includes a review and evaluation of the existing relevant environmental and climate data, evaluation of the adequacy of the data for risk evaluation purposes, identification of contaminants of concern (COCs), development of a conceptual site model, presentation of remedial objectives for the site, and a proposed approach to the development of human health risk-based SSSRLs for the site.

1.3 Organization of the Site Characterization Report

This report is organized into the following nine sections and four appendices:

- **Section 1.0 – Introduction** discusses the objectives and scope of the Site Characterization Report.
- **Section 2.0 – Site Overview** describes the site, including history, and the physical setting.
- **Section 3.0 – Previous Investigations** summarizes the previous investigations and the nature and extent of contamination.
- **Section 4.0 – Data Evaluation** presents an evaluation of the data collected at the West Plant Site and identification of COCs.
- **Section 5.0 – Conceptual Site Model** presents an evaluation of the potential sources, transport pathways, and environmental media affected within the West Plant Site, and the remedial objectives for the site.
- **Section 6.0 – Development of Site-Specific Soil Remediation Levels** presents a summary of the proposed methods and key assumptions to be used in the development of human health risk-based SSSRLs.
- **Section 7.0 – Schedule and Closing** presents a tentative schedule, and closing statements and signatures for this report,
- **Section 8.0 – References** presents the references cited in this report.
- **Appendix A – Smelter Affected Soil Characterization** presents historical data that has been previously presented (on CD only).
- **Appendix B – Summary of Golder April 2008 Test Pit Sampling Event** presents the test pit soil data collected in April 2008 in support of the future Remedial Action Workplan.
- **Appendix C – Summary of Golder February 2009 Sampling Event** presents the data collected during the February 2009 soil sampling event to augment existing datasets.
- **Appendix D – Risk-Based Screening Level Calculations in Support of Data Adequacy Evaluations** presents the software runs used to evaluate the number of samples needed for risk evaluation purposes.

2.0 SITE OVERVIEW

This section summarizes the history, topography, surface water hydrology, geology, groundwater hydrology, climate, vegetation, and soils at the West Plant Site.

2.1 Site Location and History

The West Plant Site is located adjacent to the northern edge of the town of Superior in Pinal County, Arizona (Figure 1-1). The Lake Superior and Arizona Mining Company began underground mining at the West Plant Site in 1902, and was superseded by the Magma Copper Company in 1910. The Magma Copper Company built the original concentrator at the West Plant Site in 1914. Ore and concentrate were hauled by wagon to Florence, Arizona until 1915 when the Magma Arizona Railroad was completed to the West Plant Site (Canty and Greely 1991). Planning for an on-site smelter began in 1920 and the smelter began operating in 1924. The process consisted of roasting to remove sulfur, followed by processing in a reverberatory furnace (Canty and Greely 1987). The smelter stack, which operated until 1972, is approximately 200 feet tall. The property was purchased by BHP in the mid-1990s and mining continued until mid 1996. From 2001 to 2004 exploration activities were led by Kennecott Canada Exploration and Resolution Copper Mining, LLC (RCML), was established in 2004. RCML is a Limited Liability Company owned by Resolution Copper Company (55%), a subsidiary of Rio Tinto, plc, and BHP Copper, Inc. (45%), a subsidiary of BHP Billiton plc.

A probabilistic risk assessment was developed, on behalf of BHP Copper, for the Northwest Study Area (NWS) in the northwest portion of the town of Superior, AZ, adjacent to the West Plant Site to the south. The NWS is an approximately 45 acre site that is primarily residential in nature. The NWS human health probabilistic risk assessment was developed in cooperation with the ADEQ VRP, and the assumptions and parameter distributions developed for the NWS probabilistic risk assessment were reviewed for applicability to the West Plant Site PHHRE.

2.2 Topography and Surface Water Hydrology

The West Plant Site is located on and at the edge of mountainous and rugged terrain characterized by steep slopes, cliff formations, and deeply incised canyons. The West Plant Site is west of the Apache Leap that rises to an elevation of approximately 4,600 feet above mean sea level (amsl). The West Plant Site is situated at lower elevations on moderate slopes (Figure 2-1). The site ranges in elevation from a high of approximately 3,975 feet amsl in the northern portion of the site, to a low of approximately 2,675 feet amsl at the southern edge of the site. Queen Creek Canyon, located east of the town of Superior and the West Plant Site, forms a significant topographic feature defined by an incised canyon through the Apache Leap escarpment.

The primary surface water drainage near the West Plant Site is Queen Creek (Figure 2-1) which flows through the town of Superior, south of the West Plant Site. The creek is approximately 53 miles long with channel elevations that range from approximately 5,600 feet amsl at its headwaters, to approximately 1,200 ft amsl where it discharges to the Gila River near the San Tan Mountains. The Queen Creek reach adjacent to the site is predominantly ephemeral. The West Plant Site is located primarily between two tributaries of Queen Creek, Apex Wash to the northwest and Magma Wash to the southeast. Silver King Wash is located on the northwest corner of the site. The course of Apex Wash and Magma Wash has been altered by mining activities. Before mining, Apex Wash flowed into Queen Creek west of the study area. Currently, only the lower reach of the wash flows to Queen Creek southwest of Tailings Pond 6. The wash was diverted in 1971 by the Apex Berm and Apex Tunnel (Figure 2-1) on the northern portion of the study area into the Silver King Wash located further west. This diverts run-on from the landfill and Tailings Ponds 6 and 7.

The drainage pattern within the West Plant Site is predominately from northeast to southwest. Flow in all of the drainages within the area is ephemeral. The entire West Plant Site, except for Silver King Wash, operates under a National Pollution Discharge Elimination System (NPDES), and a Multi-Sector General Permit (MSGP). Runoff from the West Plant Site and flow entering Magma Wash from the northeast are contained by various stormwater collection facilities (e.g., Indian Ponds), and pumped back to Tailings Ponds 6 and 7.

Stormwater at the West Plant Site is managed under two permits:

- **NPDES Permit AZ 0020389** – This individual permit, which includes discharge standards, has a designated outfall (Outfall 001) at the Indian Ponds. RCML pumps water from the Indian Ponds back to Tailings Pond 6, and only in extreme events would there practically be a potential to discharge under this permit. Most of the West Plant Site, excluding Silver King Wash, reports to the Indian Ponds and is therefore covered under this permit.
- **MSGP AZR05B241** – This permit covers other disturbed areas not reporting to the Indian Ponds. RCML has prepared a Stormwater Pollution Prevention Plan (SWPPP) to manage stormwater from these areas, but Silver King Wash is also excluded because it contains no disturbed areas.

Silver King Wash flows through the northwest corner of the West Plant Site and, as noted above, is not covered by RCML's stormwater related permits. Surface water samples have been collected in and near Silver King Wash by ADEQ as part of its ongoing Total Daily Maximum Load investigation for Queen Creek (Figure 1-3). The results relevant to Silver King Wash as it traverses the northwest corner of the West Plant Site are presented and evaluated in Section 4.4.

2.3 Geology and Groundwater Hydrology

Geology at the West Plant Site is divided by the approximately north-south trending Concentrator Fault at the toe of the mountain front (Figure 2-2). Rocks east of the Concentrator Fault consist of Precambrian schist, diabase, quartzite, basalt, and limestone (Apache Group) overlain by Cambrian and Paleozoic sedimentary rocks, Tertiary Volcanics (Apache Leap Tuff), and Tertiary and Quaternary Alluvium. Because of past dewatering of the underground mine, groundwater levels are approximately 1,000 feet below ground surface (bgs) at the 500 Yard facility (RCML 2010) on the eastern side of the West Plant Site (Figure 2-2).

Rocks west of the Concentrator Fault underlie most of the West Plant Site and comprise three geologic units (Figure 2-2). The first geologic unit is the Gila Conglomerate, which extends from the toe of the mountain front to the western and southern boundary of the site. As described by Peterson (1969), the Gila Formation was deposited in a broad alluvial basin and consists of gravel and conglomerate stream deposits derived from older rocks. The Gila Formation contains pebbles, cobbles, and boulders that range from angular to surrounded. The matrix is coarse, poorly sorted arkosic sandstone that varies from well consolidated to poorly consolidated and has crude to well-defined bedding. The second geologic unit is mudstone interbedded in the Gila Conglomerate that outcrops at the southwestern portion of the West Plant Site. This unit was historically used as clay for making bricks at the West Plant Site. Both the Gila Conglomerate and the interbedded mudstone are well consolidated and strongly calcite cemented. The third geologic unit overlies the Gila Conglomerate along the southeast boundary is the Quaternary Alluvium, which Peterson (1969) describes as sand and gravel deposits in partly enclosed basins or along streambeds. The materials are generally unconsolidated.

Based on the three geologic units described above and the site hydrogeologic conditions, five hydrostratigraphic units have been defined west of the Concentrator Fault as follows (Figure 2-3):

- **Mudstone Unit–** applies to the saturated, lenticular, fine grained formation within the Gila Conglomerate described above. The mudstone extends from the central portion of the site beyond the southern boundary.
- **Unconfined Gila Unit** – applies to the thick saturated zone of the Gila Conglomerate that lies north of the Mudstone Unit.
- **Confined Gila Unit** – applies to the saturated portion of the Gila Conglomerate that lies beneath the Mudstone Unit.
- **Shallow Unconfined Gila Unit** – applies to the saturated portion of the Gila Conglomerate that overlies the Mudstone Unit.
- **Alluvial Unit** – applies to saturated recent alluvium located on the southern portion of the West Plant Site near Smelter Pond.

The most notable characteristic of the hydrostratigraphic units, with the exception of the Alluvial Unit, is that the hydraulic conductivities are remarkably low, ranging from 10^{-6} to 10^{-9} centimeters per second.

These low hydraulic conductivities in turn result in slow groundwater flow rates, and limit the quantity of groundwater that flows through the site groundwater system.

Within the West Plant Site, depths to groundwater vary from approximately 175 feet bgs at well GAI-02-01 in the north, to near land surface in the Alluvial Unit at the Smelter Pond point of compliance well in the south. The approximate direction of the regional gradient is to the southwest. The most recent water table contour map is shown in Figure 2-4 (RCML 2010).

2.4 Climate

Climatic data were first collected at the West Plant Site in 1920 when daily precipitation measurements were taken. The record continues to the present and includes 90 years of data. These data through 2010 (i.e., 90 years of record) are presented on Figure 2-5 as total annual rainfall, with an annual average of approximately 18 inches during the period of record. Extreme events occurred in 1979 and 1992 when annual rainfall exceeded 35 inches. Several years had rainfall totals near 10 inches, and the lowest annual totals occurred during the droughts of 2002 and 2007 with a total of approximately 5 inches each.

A meteorological station was installed in 2002 at the West Plant Site (Figure 2-1). The equipment includes a tipping bucket rain gauge, evaporation pan at ground level, wind speed anemometer, wind direction sensor, relative humidity sensor, temperature sensor, barometric pressure sensor, nephelometer, and pyranometer. The meteorological station data (Table 2-1) show that from 2002 through 2010 there was an average pan evaporation rate of 62 inches, average rainfall of 12 inches, and an average temperature of 21 degrees Celsius. Other parameters included in the table are maximum temperature; minimum temperature; average, maximum, and minimum relative humidity; and average wind speed.

Monthly wind roses were developed for the West Plant Site as part of earlier data evaluations (Golder 2008a) from meteorological data over a period of one year (August 2002 to July 2003). These wind roses show prevailing winds from the NNE and WSW for that period (Figure 2-6). Note that this time period was characterized by drought and may or may not be representative of the entire time period that the smelter operated (i.e., approximately 1920 to 1970).

Examination of each individual monthly wind rose a over one-year period suggests a seasonal switch from predominantly WSW winds in the hotter months (May to October) to mostly NNE winds in the cooler months (November to April). These directions correspond to areas of high relief (the highlands NNE of the Apache Leap cliffs) and those of lower relief (the desert WSW of Superior). The timing of these prevailing wind directions/speeds suggest that these patterns are convection-driven, with upslope drafts of warmer air from the desert dominant in the warmer months, and downdrafts of cooler air from the higher-relief areas dominant in winter.

2.5 Vegetation and Soils

The vegetation in the lower elevation portions of the West Plant Site is classified as the Arizona Upland subdivision of the Sonoran Desert. The perennial vegetation includes saguaro, ocotillo, prickly pear, and cholla cacti, foothill and blue paloverde, ironwood, mesquite, and creosotebush. In addition to perennial vegetation, the Sonoran Desert also has annual species that grow only after brief moist periods in the spring and in the summer, including lupine, Mexican gold poppy, desert bluebell, globemallow, desert marigold, and several varieties of primrose.

The vegetation in the higher elevation portions of the West Plant Site (in the North Mountain Front area) is transitional to the Interior Chaparral classification. Chaparral consists of deep-rooted evergreen shrubs and trees. Although 50 or more shrub species are in the chaparral vegetation zone in Arizona, generally fewer than 15 are important in terms of density. Shrub canopy cover may vary from less than 40% on dry sites to more than 80% on wetter sites. Annual and perennial grasses and forbs may grow where the overstory canopy is only moderately dense or is open.

The hillsides comprising the northern and western boundary of the West Plant Site are covered with aridisols: “developed soils of dry regions” with light-colored surface layers, containing low organic matter, abundant calcium carbonate and varying amounts of soluble salts. Site aridisols fall into three soil temperature regimes:

- Hyperthermic arid soils - mean annual soil temperature of 72° F or greater, maximum annual precipitation 10 inches,
- Thermic semiarid soils - mean annual soil temperature of 59-72° F, annual precipitation 10-18 inches, and
- Mesic subhumid soils - mean annual soil temperature of 47-59° F, annual precipitation 16 inches or greater.

Arizona Upland vegetation grows in higher elevation hyperthermic arid soils and lower elevation thermic semiarid soils. Chaparral vegetation grows mostly in mesic subhumid soils.

The information in this section was paraphrased from Chapter 4, Natural Vegetation of Arizona, Books of the Southwest accessed on-line through the University of Arizona website (2008): (southwest.library.arizona.edu/azso/body.1_div.4.html) and also from Hendricks (1985).

2.6 Land Areas

For the purposes of site characterization and risk evaluation, the West Plant Site is divided into four discrete land areas based on site history, topography, accessibility, contaminant transport, and frequency of use characteristics (Figure 1-2). Variations in these parameters affect the level of contamination in the soil, as well as the types of use and frequency of contact with soil by humans that enter these areas. Each land area is described below. Possible entry points for the land areas are shown in Figure 1-2.

2.6.1 East Mountain Front Area

The East Mountain Front (EMF) land area is the ridge bounded by the 500 Yard and the town of Superior on the west, Queen Creek on the south and east, and the Salt River Project power line on the north. This area comprises approximately 149 acres. Figure 2-7 provides an oblique view of the EMF in relation to the town of Superior to illustrate difference in topography between the EMF and the town of Superior.

Public access to the EMF is illegal and restricted. Entry from the west side (including the town of Superior) is currently controlled by the mine gate and security, and is further hindered steep topography on all sides, as shown on Figure 2-7. Entry from the east side is from State Route 60 or walking upstream along Queen Creek from the town of Superior. The terrain is rugged on either side of the ridge comprising the EMF. This limits accessibility to the area to those who are physically fit, and able to enter from the highway (i.e., not from the town).

2.6.2 Industrial Area

The Industrial Area (IA) is bounded by the property line in some places and by the other land areas in other places. This area comprises approximately 1,106 acres, which is most of the West Plant Site, as shown in Figure 1-2. The industrial use is mining related.

Public access is illegal and restricted, and is minimal. Entry upon the IA can be by:

- Invitation through the mine gates (which are staffed and monitored by security personnel),
- Low-level occasional trespassing on dirt roads near the clay pit on the western edge, and
- Low-level occasional trespassing through a locked fence at the northern property boundary on the 4-wheel drive trail northeast of Apex Wash.

There is a 163-acre zone surrounding the stack within the Industrial Area where soil concentrations are consistently above 500 milligrams per kilogram (mg/kg) arsenic (as shown in Figure 3-2). The soil in this zone, called the Stack Zone, will be remediated by removal of soil to the to-be-determined SSSRLs when the West Plant Site remediation is conducted. This area is therefore excluded from further risk evaluation, since RCML has decided that remediation is inevitable, and no additional evaluations are needed to revise that decision or reduce the uncertainty regarding the decision. In the area outside the Stack Zone (943 acres), about 319 acres can be defined as non-soil areas that are comprised of tailings ponds, settling ponds, slag piles, and the rock quarry that have either had the soil removed or will be covered with vegetative cover material as part of closure. These areas are excluded from risk evaluations since the cover material in these areas will contain soil concentrations below groundwater protection levels (GPLs), and an interim value of 100 mg/kg for arsenic (adopted by RCML until VRP remediation levels are established for this area). The remaining 622 acres are aridisol soils, which will be included in the risk evaluation.

2.6.3 North Mountain Front Area

The North Mountain Front (NMF) land area is bounded by the IA to the west and south, by the property line to the north, and by rocky outcrops to the east. This area comprises approximately 501 acres. Figure 2-7 provides an oblique view of the NMF in relation to the town of Superior to illustrate difference in topography between the NMF above the EMF and the town of Superior.

Public access to the NMF is illegal and restricted. The terrain is rugged and steep; footing is treacherous and trespassing upon the NMF is extremely difficult. Entry upon the NMF can be by:

- Invitation through the mine gates (which are staffed and monitored by security personnel),
- Trespassing through a locked mine fence at the end of the truck ramp on State Route 60, at the southern boundary of this area, and
- Trespassing by hiking up the steep ravines from the 4-wheel drive trail northeast of Apex Wash.

The steep rugged nature of the terrain in the NMF makes this high-relief area extremely difficult to enter. Much of the NMF consists of steep slopes covered with desert vegetation (in those places where plants can take hold and actually grow). Drainage areas that are at first glance most suitable for hiking trespassers are often completely overgrown with desert spoon, catclaw, and other spiny desert plants, making foot travel difficult despite the lesser grade. Footing is unpredictable because slope-forming rock is often loose and jagged, and the high exposure on much of the slopes makes traversing especially dangerous. The summer heat is extreme on the west-facing slopes.

The difficulty in traversing the NMF is quantified in the field sampling log presented in Table 2-2. The average rate for walking from one sample location to another (excluding samples located next to a parking spot for the field vehicle) is 32 feet per minute, or approximately 1/3 mile per hour. In contrast, a typical walking rate on a flat city street is about 15 to 20 minutes per mile, which translates to about 390 to 260 feet per minute (or approximately 3 to 4 miles per hour), respectively. The walking rate in the NMF area is about nine times slower that a typical city street walking pace.

2.6.4 Silver King Wash Area

The Silver King Wash (SKW) land area is generally the channel and floodplain bounded by the property line on the west and north and the hill slopes on the east. It should be noted that the channel sediment, while included in this land area, is continually changing as sediment moves into and out of this reach during flows. This area comprises approximately 37 acres.

Public access to Silver King Wash area is illegal. The SKW has few visitors, and occasional visitors include trespassers with all-terrain vehicles, most commonly enter this area using the Silver King Road, west of the town of Superior.

2.7 Land Use

RCML has selected the current and reasonably foreseeable future land use for the West Plant Site to be industrial use, in accordance with AAC R18-16-406(G). Industrial workers are present at varying levels of frequency in each land area. In the Industrial Area, workers are present on a typical work day. Industrial workers may visit the remaining areas infrequently, at varying levels of contact.

RCML had previously considered allowing recreational use of some portions of the West Plant Site by outside parties. In that light, previous studies of the West Plant Site conducted by Golder (2007, 2008a, and 2008b) evaluated potential use of some portions of the site by recreators. RCML has since re-evaluated their options, and have determined that the land use for the entire site will be industrial, and that any non-industrial use of the site will be considered trespassing.

3.0 PREVIOUS INVESTIGATIONS

Both Brown & Caldwell Inc. (B&C) and Golder have previously investigated smelter-affected soil at the West Plant Site. B&C was retained by the previous mine owner, BHP, and Golder is currently retained by RCML. The Golder and B&C datasets are comparable with respect to particle size fraction and laboratory methods and are described in this section.

Figure 3-1 shows the sample locations for the sampling events relevant to the risk evaluation. Figures 3-2 and 3-3 provide the arsenic and copper concentrations, respectively, for each sample location. Figure 3-4 presents the lead concentrations for sample locations where lead data were collected.

A thin surface "gray layer" is present near the stack. This layer diminishes with distance from the stack until it is no longer visible. The B&C sample collection methods did not differentiate the gray layer and may have mixed the gray layer and the underlying brown soil, whereas the Golder sample collection methods separated the gray layer and the underlying brown soil where present.

3.1 Brown & Caldwell 1998 Investigation

BHP commissioned B&C to develop a remediation action plan (B&C 1998) to delineate affected areas, to provide data for risk evaluation and to evaluate remediation options. The 10-series dataset from that investigation is useful for the human health risk evaluation because it represents a<250 micrometer (µm) particle size fraction of surface soil.

Samples were collected between February and July 1998. A total of 270 samples were collected at 186 locations on a grid that did not distinguish between soil and waste facilities. The samples also did not distinguish any soil layering. These samples included 190 surface samples (0 to 0.8 inch bgs, 60 subsurface samples (varying depth intervals between 0.8 and 24 inches bgs), and 20 duplicate samples). Figure 3-1 shows the sample locations. The data package for this sampling event is presented in Appendix A1 (CD only).

Samples were analyzed by Inductively Coupled Plasma/Graphite Furnace Atomic Adsorption (ICP/GFAA) at Del Mar Analytical in Phoenix, Arizona for arsenic and copper. The arsenic and copper results for the samples that were collected from soil (i.e., not from waste facilities) are used in the evaluations in this report, and presented in Table 3-1. The B&C dataset consisted of 123 surface soil samples, collected from 0-2" bgs, that were analyzed for arsenic and copper. Arsenic concentrations ranged from 2 to 5,100 mg/kg, with an average concentration of 616 mg/kg and a median of 150 mg/kg. Copper concentrations ranged from 75 to 220,000 mg/kg, with an average concentration of 13,715 mg/kg and a median of 1,900 mg/kg.

A subset of 10 samples was analyzed for additional constituents: antimony, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver, thallium, and zinc. These data are presented in Table 3-2, and the data package for this subset is included in Appendix A1 (CD only).

The laboratory data were validated by Quality by Design (QBD), and their report is presented in Appendix A3 (CD only). Further discussion of the data quality is in Section 4.1.

3.2 Golder 2001 Investigation

As part of due diligence on behalf of RCML, Golder collected additional soil samples in October 2001 to evaluate the earlier B&C data. The objectives were to:

- Confirm the COCs
- Evaluate the vertical and lateral extent of the gray layer
- Provide samples for assessment of bioavailability
- Expand the dataset used for risk evaluation

3.2.1 Metals Data

A one-day sampling event was conducted by Golder staff on October 5, 2001. Sample locations were selected using professional judgment including two transects approximately perpendicular and parallel to two possible predominant wind directions (i.e., southwest to northeast, southeast to northwest). The sample locations were also varied by hill slope position (i.e., toe, mid-slope, and crest); aspect (i.e., facing stack and facing away from stack); distance from the stack; and location with respect to the stack (i.e., upwind and downwind). A total of 19 soil samples were collected with 9 samples from the surface gray layer, 9 samples from the underlying brown soil, and 1 blind field duplicate sample for quality assurance purposes (i.e., GAI-11S is a duplicate of GAI-7S). Care was taken to not mix material from the gray layer and underlying brown soil during sampling. A tenth sample that was proposed for both layers was not collected because of time constraints. Table 3-3 summarizes the field information for the samples, and Figure 3-1 shows the sample locations. Complete sample descriptions are presented in Appendix A2 (CD only).

The analytical results from the gray layer included arsenic concentrations ranging between 448 and 6,990 mg/kg, with an average concentration of 2,867 mg/kg and a median of 2,730 mg/kg; and copper concentrations ranging between 6,590 and 259,000 mg/kg, with an average concentration of 98,349 mg/kg and a median of 85,150 mg/kg.

The analytical results from the underlying layer included arsenic concentrations ranging between 67 and 357 mg/kg, with an average concentration of 258 mg/kg and a median of 246 mg/kg; and copper concentrations ranging between 1,280 and 5,650 mg/kg, with an average concentration of 3,498 mg/kg and a median of 3,390 mg/kg.

The samples were sieved for the <250 µm size fraction and analyzed for metals and paste pH at Silver Valley Analytical Laboratory in Kellogg, Idaho. A total of 23 metals, corresponding to those metals with established nonresidential soil remediation levels (SRLs), were analyzed. The metals analyzed were aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, thallium, tin, vanadium, and zinc. SW-846 laboratory methods were used. A split of each sample was forwarded to the University of Colorado Laboratory for Environmental and Geological Studies (UCLEGS) to determine arsenic and copper mineralogy by electron microprobe analysis (EMPA), as described in Section 3.2.2.

The analytical results were validated by Golder staff using U.S. Environmental Protection Agency (USEPA) methods. No data were rejected and all data were considered usable for project objectives. The analytical results for the gray layer and the underlying layer samples are presented in Tables 3-4 and 3-5, respectively. The validation report and laboratory data sheets are presented in Appendix A2 (CD only).

3.2.2 Bioavailability Data

Splits of the samples described in Section 3.2.1, including duplicates, were submitted to the UCLEGS for detailed mineralogical analysis. The purpose of the mineralogical analysis was to evaluate the bioavailability of arsenic and copper in the soil. It was hypothesized that most of the arsenic and copper would be present in the less-soluble mineral phases commonly associated with mining sites, and that this information could be used to evaluate the bioavailability of arsenic and copper for the human health risk evaluation.

Ten shallow samples (including duplicate sample GAI-11S) and nine deep samples were submitted to the UCLEGS for analysis of arsenic- and copper-bearing mineralogical phases using EMPA. The samples were sieved to the <250 µm fraction. The EMPA was used to identify all arsenic- and copper-bearing particles in the <250 µm fraction of the samples. Each of the mineral phases identified was reported in terms of frequency of occurrence and relative percent mass of arsenic and copper. A detailed description of the procedure is in Appendix A of the Guide for Incorporating Bioavailability Adjustments into Human Health and Ecological Risk Assessments at U.S. Navy and Marine Corps Facilities, Part 2: Technical Background Document for Assessing Metals Bioavailability (Battelle and Exponent 2000). The results of the mineralogical analyses are presented in Appendix A5 (CD only).

A bioavailability value for arsenic of 40% recommended by ADEQ for the probabilistic risk assessment conducted on behalf of BHP Copper for the Northwest Study Area in the town of Superior, adjacent to the West Plant Site. ADEQ indicated, in their comments on previous West Plant Site submittals under the APP program, that a 40% bioavailability value for arsenic should be used for the West Plant Site in order to be is consistent with the Northwest Study Area. Therefore, the EMPA data are not further evaluated in

this report. An additional *in vitro* bioaccessibility study for arsenic will be proposed by Golder to the VRP under separate cover to evaluate the bioavailability of arsenic in site soils. The results of this study, if accepted by the VRP, will be used to determine SSSRLs.

3.3 Recent Golder Investigations

Smelter affected soils were included as a scheduled compliance item in the Area-wide APP beginning in 2007 when the permit was initiated. At that time, Golder began evaluating the existing dataset for risk evaluation purposes, and identified additional data needs, as described below.

3.3.1 February 2008 Surface Soil Investigation

Golder evaluated the adequacy of the B&C data effort in the Human Health Risk Assessment (HHRA) Work Plan (Golder 2007) for risk evaluation purposes. In that evaluation, Golder recognized the need for additional data for the Silver King Wash Area and East Mountain Front. Golder initially determined that no further sampling was required in the North Mountain Front.

ADEQ comments on the HHRA Work Plan (Clark 2008a) suggested that the original B&C sampling grid be extended to the east in the East Mountain Front and North Mountain Front areas. These additional sample locations were added to the sample plan.

Golder collected additional samples from the Silver King Wash Area, East Mountain Front, and North Mountain Front land areas in February of 2008. The locations of these samples are presented in Figure 3-1. The results are presented in Table 3-6. Golder collected a total of 31 surface (0 to 2 inches bgs) soil samples as shown below.

- Seven samples (six samples and one quality assurance /quality control [QA/QC] sample) were collected from the East Mountain Front.
- Seventeen samples (fifteen samples and two QA/QC samples) were collected from the North Mountain Front.
- Seven samples (six samples and one QA/QC sample) were collected from Silver King Wash Area.

Samples were analyzed for arsenic, copper, and lead in accordance with the field sampling plan in Appendix C of the HHRA Work Plan (Golder 2007).

Results from this sampling event were validated according to the quality assurance guidelines set forth in the quality assurance project plan that was included in the Area-wide APP (Golder 2005). Innovative Technical Solutions, Inc. (ITSI) of Tempe, Arizona, served as a third-party data validator. The data sheets and data validation report from this sampling event are presented in Appendix A6 (CD only).

3.3.2 February 2009 Surface Soil Investigation

Surface soil total metals results from the February 2008 sampling event indicated high lead in the hills to the east and north of the West Plant Site (Golder 2008a). In order to confirm or disprove that these lead results were anomalous (and, if confirmed, to understand their nature and extent), Golder conducted a tiered sampling of surface soils in these areas. Sampling consisted of:

- Tier 1: Field Confirmation. This tier consisted of an effort to confirm or disprove the anomalous lead concentrations using in-situ x-ray fluorescence (XRF) measurements, and
- Tier 2: Laboratory Confirmation. Samples with lead levels above the minimum GPL (290 mg/kg) by XRF were shipped to an analytical laboratory, where they were subjected to total metals analysis of bulk samples. In addition, the laboratory sieved the samples and conducted total metals analysis and synthetic precipitation leaching procedure (SPLP) metals analysis for arsenic, copper and lead.

Golder completed the field XRF study in April 2009. Soils/sediments at the original February 2008 sample locations registering above the Minimum GPL of 290 mg/kg lead were located, and in-situ XRF measurements were taken at the four cardinal points of the compass, at a distance 10 feet out from the originally-sampled 2008 location.

Golder staff ultimately collected XRF measurements at a total of 14 locations in the East Mountain Front and at three locations in the North Mountain Front. Three to four XRF measurements were collected at each location (less than four measurements occurred when no soil was available at a cardinal point location), and the mean of each of the subsample sets were calculated (Table 3-7). Of these, eleven composited samples (eight from the East Mountain Front and one from the North Mountain Front) exhibited lead levels above 290 mg/kg and were sent to the laboratory for confirmatory analysis.

At the analytical laboratory, samples were analyzed for total arsenic, copper, and lead in accordance with the field sampling plan in Appendix C of the HHRA Work Plan (Golder 2007) and select samples were also analyzed by synthetic precipitation leaching procedure (SPLP) for arsenic, copper and lead. Reduced bulk-fraction XRF data, as well as total metals from the <250 um fraction collected during this sampling event, are included in Appendix C.

The <250 µm size fraction samples that were analyzed for arsenic, copper, and lead are presented in Table 3-6. Field XRF measurements for lead, as well as confirmatory total metals and SPLP results for arsenic, copper and lead in bulk soil samples are presented in Table 3-7.

Results from analysis of the <250 um fraction indicate that laboratory arsenic concentrations are elevated above the non-residential SRL in all February 2009 sample locations, but only exceeded the GPL in one location. Conversely, lead concentrations exceed the GPL in approximately 50% of the laboratory results in the Eastern Mountain Front.

For bulk samples, mean XRF lead results generally overestimate concentrations indicated in laboratory analysis, and lead was detected above the groundwater protection level (GPL) in only five out of the nine Eastern Mountain Front XRF samples sent to the lab for confirmatory analysis. Laboratory analysis did confirm localized variability in lead concentrations in the Eastern Mountain Front, however, with variability ranging from as low as 57 mg/kg to as much as nearly 300 mg/kg between samples collected in the same "cardinal point" cluster. Since samples collected on the cardinal points of the compass are generally no more than 14 feet away from each other, this study emphasizes a significant degree of variability on a small scale.

3.3.3 April 2008 Test Pit Investigation

In April of 2008, Golder collected 123 sediment samples from 30 shallow test pits in the IA. The <250 um fraction (sieved) was analyzed on all samples, and the bulk fraction (unseived) samples were variably analyzed. The locations of the test pits are shown in Figure 3-5. This sampling was undertaken in support of planned remedial action and was designed to:

- Better understand the relationship between concentration-depth-distance from stack for remedial design in the IA
- Evaluate the potential for metals to leach from affected materials left in place (materials below the cleanup level) via SPLP analysis
- Better understand the relationship between arsenic, copper, and lead in both the <250 µm and bulk fractions
- Provide aliquots for future XRF calibration

Although these data were planned to support the development of the remedial action plan and not in support of risk evaluation, the data do add to the existing dataset by providing concentrations at depth within the IA, and provide SPLP data for use in evaluations of potential effects to groundwater.

Test pit locations were selected based on the wind directions for the West Plant site as based on the wind rose available at the time of the evaluation. The March 2002 diagram was selected because it best represented the average year-round pattern.

Test pits were excavated to a maximum depth of 4 feet bgs and discrete samples were collected from the following intervals:

- 0 to 2 inches bgs
- 2 inches to1 foot bgs
- 1 to 2 feet bgs
- 2 to 3 feet bgs
- 3 to 4 feet bgs

Soil samples from the test pits were analyzed by ICP techniques in accordance with a field sampling plan. The sieved (<250 µm fraction) samples were split at the laboratory; one split underwent total metals analysis for arsenic, copper, and lead (Table 3-8); and the other was subjected to XRF analysis for these same constituents to develop a set of XRF calibration curves for future use during remediation (results not reported in this document).

The bulk fraction for a subset of 16 of the samples was analyzed for an extended list of metals for total metals analysis, and for SPLP analysis (Tables 3-9 and 3-10, respectively). The data sheets and data validation report for this sampling event are presented in Appendix B.

Results from analysis of the <250 µm fraction indicate that arsenic concentrations exceed the non-residential SRL in all 16 samples collected, but exceeded the GPL for arsenic in only seven out of 16 samples. In those instances where arsenic was detected above the GPL, the samples were generally shallow (GPL exceedances are commonly found in the top one foot of soil). All sample results below one foot bgs depth were below the GPL for arsenic, except for those samples collected nearest to the stack (TP-04, TP-10, TP-14, TP-15, and TP-17).

Lead in surface soils (commonly between 0-1 feet bgs) exceeded its GPL more frequently than its non-residential SRL. One sample near the stack (RAWTP-17) yielded a GPL exceedance at the greatest depth (348 mg/kg between 2-3 feet bgs).

4.0 DATA EVALUATION

This section evaluates the combined datasets, describes the nature and extent of contamination, and identifies the constituents of concern for the risk evaluation.

4.1 Evaluation of Existing Data

This section evaluates the five existing datasets (B&C 1998; Golder 2001; Golder February and April 2008; and Golder February 2009) for their usefulness in determining the nature and extent of contamination, and for assessing risk to human health. The datasets are evaluated with respect to sampling design, sample type, depth interval, particle size fraction, age, and laboratory data quality. The adequacy of the number of existing samples for risk evaluation is discussed in Section 4.1.3.

4.1.1 Data Validation and Quality Assessment

All datasets have been validated. Quality by Design (QBD) validated the B&C data in 1998 on behalf of BHP, and RCML had Innovative Technical Solutions inc. (ITSI) prepare an independent quality control summary report in 2007 that reviewed the previous validation, as presented in Appendix A3. ITSI concluded that there were minimal quality control deficiencies. The data that were qualified as estimated were of acceptable quality and are usable for their intended purposes. Similarly, no data from the Golder 2001 dataset were rejected and all were considered usable for project objectives, as presented in Appendix A2. ITSI also validated the results of the Golder April 2008 (total metals and SPLP metals), and February 2009 (total metals and SPLP metals) sampling events (Appendices B and C, respectively). There were two rejected mercury SPLP results in the April 2008 data. All mercury results were qualified as “J” for estimated because the samples were extracted past the holding time, and the two mercury results that were identified as non-detected were qualified as “R” for rejected.

4.1.2 Data Evaluation

The B&C and Golder datasets were based on different sampling designs. The B&C 1998 samples (and Golder 2008 samples from the North Mountain Front) were collected on a grid, whereas the Golder 2001 and 2009 samples were collected using professional judgment (to represent the range of variability in the high concentration area near the stack, and to confirm/disprove anomalously high levels of lead in surface soils, respectively). The initial B&C 1998 sampling grid did not discriminate between contaminated soil and waste material (e.g., tailings, slag); consequently only 135 of those B&C soil samples are comparable to the Golder samples. Golder 2008 sample sites in the East Mountain Front and Silver King Wash Area were selected randomly using the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) approach (the use of nonparametric statistical methods for evaluating environmental data). Golder 2009 sample sites were selected based on the results of the 2008 sampling.

B&C and Golder both collected similar sample types, insomuch as they were discrete surface samples (generally from 0 to approximately 2 inches) and samples vertically composited at various depth intervals below the surface. However, these datasets are less comparable with respect to soil layering. The Golder 2001 samples separated the gray layer and underlying brown soil where present; some of the B&C samples may have mixed the two layers. The Golder 2008 and 2009 samples, while also collected from 0 to 2 inches bgs, were collected from peripheral areas of the West Plant Site where the gray layer was not observed.

Both the 1998 B&C samples and all Golder samples (2001, 2008 and 2009) were sieved to <250 µm particle size fraction at the analytical laboratory. The <250 µm particle size fraction is relevant for risk evaluation purposes from inhalation and from ingestion via adherence to human skin.

The Golder 2008 and 2009 samples are contemporary (the B&C 1998 dataset is 12 years old and the Golder 2001 dataset is nine years old). The four datasets for arsenic and copper are compared as box and whisker plots in Figure 4-1.

The Golder 2001 dataset is similar to the high concentration end of the B&C dataset, which is reasonable given that the Golder 2001 samples were collected near the stack. The Golder 2008 and 2009 datasets are similar to the low concentration end of the B&C 1998 dataset, which is reasonable given that the Golder 2008 and 2009 samples were collected from peripheral areas of the West Plant Site. In the combined datasets, arsenic concentrations ranged between 2 and 6,990 mg/kg, and copper concentrations ranged from 75 to 259,000 mg/kg.

The fact that no Golder dataset shows lower concentrations than the B&C 1998 dataset shows that the concentration distributions have not shifted in the years between their collection dates. Given the calcareous nature of the soil at the site, metals sorption would be expected to occur, which in turn would reduce the potential for concentrations to change over time.

The B&C 1998, Golder 2001, Golder 2008 and Golder 2009 datasets are generally comparable, especially regarding particle size fraction (an important factor) and metals concentrations. The quality of all four datasets is acceptable for evaluating the nature and extent of contamination as well as for performing risk calculations. Therefore, all four datasets are usable in the risk evaluation.

4.1.3 Adequacy of the Number of Existing Samples for the Risk Evaluation

An evaluation of the adequacy of the number of existing samples to conduct the risk evaluation was conducted, as described in detail in Appendix D. The usability of the existing datasets with respect to sampling design, sample type, depth interval, particle size fraction, and laboratory quality was discussed in Section 4.1.2.

A risk evaluation was conducted to develop risk-based screening levels (RBSLs) for the purpose of conducting data adequacy evaluations. The RBSLs represent potential threshold levels for each land area in the data adequacy evaluation.

The adequacy of the existing number of samples for each land area was evaluated using the algorithms available in Visual Sampling Plan (VSP) Version 5.9, a sampling design package available to the public from Pacific Northwest National Laboratory. Arsenic results were used in the algorithms to test the adequacy of the number of samples because it is likely that arsenic concentrations will drive the risk evaluation results and SSSRLs (as described in further detail in Section 4.3).

The required inputs to VSP are a map of each land area, the standard deviation of the concentration distribution, the false positive and false negative error rates, the limits of the gray region (a VSP parameter), and a fixed threshold (i.e., a risk-based screening level [RBSL]). The standard deviation of surface soil arsenic concentrations was derived from existing B&C (1998) surface samples, as well as from sample results of the Golder 2008 and (where applicable) 2009 events within each land area (Figure 1-2, and Table 4-1). Sampling designs used an alpha (false rejection rate) of 5%, a beta (false acceptance rate) of 10%, and a gray region fixed at half the RBSL.

Note that the gray region used in VSP has no relation to the gray layer observed in the vicinity of the stack at the West Plant Site (as described in Section 4.2.4). As noted above, the gray region in VSP is a parameter related to alpha, beta, and the fixed threshold. The use of the terms gray region and gray layer is simply an unfortunate coincidence in technical terminology, not an indicator of any connection between the two terms.

A screening-level risk evaluation was conducted to develop the RBSLs for the VSP calculations. The RBSLs were developed primarily using conservative, standard default exposure assumptions and deterministic methodology to calculate potential human health risks and subsequent screening levels, strictly for the purpose of providing a fixed threshold for use in VSP calculations for data adequacy.

The RBSLs for arsenic as a carcinogen are identified in Appendix D, and are summarized below.

- East Mountain Front – The 10^{-5} cancer RBSL for this area is about 300 mg/kg arsenic, which is lower than the maximum observed arsenic concentration in the EMF of 387 mg/kg.
- Industrial Area – The 10^{-5} cancer RBSL for this area is about 170 mg/kg arsenic, which is lower than the maximum observed arsenic concentration in the IA of 490 mg/kg.
- North Mountain Front – The 10^{-5} cancer RBSL for this area is about 600 mg/kg arsenic, which is above the maximum observed arsenic concentration in the NMF of 360 mg/kg.
- Silver King Wash – The 10^{-5} cancer RBSL for this area is about 300 mg/kg arsenic, which is above the maximum observed arsenic concentrations in the SKW of 127 mg/kg.

The arsenic data used in the VSP are presented in Table 4-1. The following matrix shows the number of samples required for each land area, based on VSP predictions, for risk evaluation purposes. The matrix also shows the number of existing samples in each land area (excluding duplicates, or data from the Stack Zone), and the number of additional samples needed. The VSP results indicate that an adequate number of samples have already been collected all land areas.

Land Area	RRSL (arsenic in mg/kg)	Number of Samples Predicted by VSP	Number of Existing Samples (for Arsenic)	Number of Additional Samples Needed
East Mountain Front Area	300	15	19	---
Industrial Area *	170	48	72	---
North Mountain Front Area	600	12	37	---
Silver King Wash Area	300	11	11	---

* Does not include the Stack Zone

4.2 Nature and Extent of Contamination

The nature and extent of contamination must be understood to develop a conceptual site model for risk evaluation purposes and to have confidence in the data used for risk evaluation and remedial design.

The discussion of nature and extent focuses primarily on arsenic and copper for two reasons. First, arsenic and copper were consistently analyzed in all existing datasets, and there are simply more data available for arsenic and copper than for other metals. Second, arsenic and copper have high concentrations in soil and arsenic is a known carcinogen; thus both are likely to be drivers for soil cleanup. Nature and extent were evaluated primarily with the 10-series data collected by B&C (1998), but also with the additional data collected by Golder in 2001, 2008, and 2009.

4.2.1 Lateral Extent of Contamination

The B&C 10-series dataset for surface soil (i.e., 0 to 0.8 inch depth) and all three Golder datasets were used to contour surface soil isopleths for arsenic and copper (Figures 3-2 and 3-3, respectively) to represent the inferred concentrations of these constituents in surface soil. The isopleths for arsenic and copper suggest a primary area and a secondary area of metals-affected soil. The primary area is located on the hillsides to the northwest of the smelter stack where arsenic and copper concentrations are the highest. A secondary area of slightly elevated arsenic and copper concentrations occurs on the mountain slopes to the northeast of the smelter. The mountain slope concentrations are low compared to the concentrations on the hillsides to the northwest of the stack.

An evaluation of the potential effects of wind direction/speed on the distribution of constituents from in the West Plant Site was conducted in the workplan for the human health risk assessment (Golder 2007). At that time, the only available wind data for a complete one-year period were from August 2002 to July 2003. These data are presented in Figure 2-6 (monthly wind roses), and were used to develop Figures 4-2 and 4-3.

Cross sections of arsenic concentrations in surface sediment taken from a northeast/southwest and a northwest/southeast axis from the stack indicate that some degree of control may be attributable to both elevation and to wind direction/speed (Figures 4-2 and 4-3). Further assessment of the data indicates prevailing winds from the NNE and WSW over a period of one year (August 2002 to July 2003). Examination of each individual monthly wind rose over this period (Figure 2-6) suggests a seasonal switch from predominantly WSW winds in the hotter months (May to October) to mostly NNE winds in the cooler months (November to April). The WSW winds could account for areas of secondary elevated arsenic and copper concentrations on the slopes of the East and North Mountain Fronts due to summertime deposition.

Arsenic concentrations do not decrease in a linear fashion with increased distance from the stack. Instead, for the distance shown in these cross sections, arsenic concentrations decrease exponentially, as shown in Figure 4-4. Within that broad trend, however, minor fluctuations in arsenic concentration do occur, corresponding roughly to changes in elevation. Generally speaking, the magnitude of these fluctuations decreases with increased distance from the stack. To further illustrate on a smaller scale, the inset chart in Figure 4-4 shows a subset of arsenic concentrations under 1,000 mg/kg. In this insert chart, arsenic concentrations are very high in the area surrounding the stack, and are consistently below 500 mg/kg beyond a distance of approximately 3,200 ft from the stack. The Stack Zone (as described in Section 2.6.2) contains all observed arsenic concentrations above 500 mg/kg.

Ultimately, the simplest control on soil arsenic concentration may be distance from the source. Figures 4-4 and 4-5 show the arsenic and copper concentrations, respectively, plotted with distance from the smelter stack. Because the Golder April 2009 sampling event was confirmatory in nature, and the Golder February 2008 sampling event was for remediation design purposes, only data from the prior three datasets (B&C 1998; Golder 2001; and Golder 2008) were considered relevant and were used to generate these figures. Concentrations of arsenic in the surface soils range from 1.8 to 6,990 mg/kg across the West Plant Site. Arsenic concentrations in the surface soil decrease from the highest concentrations near the stack to approximately 45.3 mg/kg within 10,000 feet of the stack (Figure 4-4). Copper concentrations in the surface soil range from 75 to 259,000 mg/kg, decreasing to approximately 460 mg/kg within 10,000 feet of the stack (Figure 4-5). Figure 4-5 shows a subset of subset of copper concentrations under the nonresidential soil remediation level (SRL) of 41,000 mg/kg for copper. In this

inset chart, copper concentrations are very high in the area surrounding the stack, and are consistently below 41,000 mg/kg beyond a distance of approximately 2,500 ft from the stack.

Concentrations for other metals, such as antimony, cadmium, cobalt, iron, lead, mercury, nickel, silver, tin, and zinc also exhibit a similar pattern by distance, as shown in additional plots in Appendix A4. However, concentrations for some metals (e.g., aluminum, barium, and manganese) do not show trends with distance.

By comparing arsenic and copper concentrations in the isopleth maps and the plots with distance, the extent of arsenic impacts relative to copper impacts can be discerned. Generalized equivalent concentrations regarding lateral extent are as follows:

Approximate Distance from Stack (feet)	Arsenic (mg/kg)	Copper(mg/kg)
2,000	1,000	20,000
3,000	500	10,000
5,000	250	3,500
7,500	100	1,000

4.2.2 Anomalous Lead Evaluation

The Golder 2009 sampling event was conducted to confirm or disprove that elevated lead results in the EMF and NMF were anomalous (Tier 1), and if confirmed, to understand their nature and extent (Tier 2) by resampling in four cardinal directions from the original sample location. The results can be summarized as follows:

East Mountain Front

- The mean XRF results (from a composite of three subsamples) were above the minimum GPL for lead in eight out of 14 resample locations.
- The confirmatory laboratory results for the composite XRF samples were above the minimum GPL for lead in five out of nine confirmatory samples.
- The laboratory results for the composite XRF samples were above the minimum GPL for arsenic in one out of nine samples.

North Mountain Front

- The mean XRF results (from a composite of three subsamples) were above the minimum GPL for lead in one out of three resample locations.
- The confirmatory laboratory results for the composite XRF samples were above the minimum GPL for lead in zero out of two confirmatory samples.

- The arsenic minimum GPL was not exceeded in the NMF.

The results indicate that lead is present in the EMF and NMF above the minimum GPL, and is likely not anomalous. Further analysis of lead in the EMF and NMF (using SPLP data to develop alternative GPLs) is presented in Section 4.3.2.

4.2.3 Vertical Extent of Contamination

The vertical extent of impacts to soil can be specifically evaluated regarding layering using the October 2001 dataset, but the impacts can be better evaluated regarding general trends with depth using the more extensive B&C 10-series dataset. An understanding of both the October 2001 dataset and the B&C 10-series dataset is needed to determine whether the gray layer exists and has any practical significance to remedial actions.

The October 2001 sampling event was designed to evaluate layering, and the data from that sampling event show that the gray layer is visually distinct (Figure 4-6). The gray layer is generally a light olive gray, loose, dry, silty sand with gravel, whereas the underlying brown layer is generally a slightly cemented, moderate, yellowish brown silty sand with gravel (Table 3-3). Geologic descriptions and photographs of all samples collected in the October 2001 sampling event are provided in Appendix A2.

The relationship between concentrations in the gray and underlying layers is shown in the cross plots on Figures 4-7 and 4-8 for arsenic and copper, respectively. For both metals, the clustering of points below the diagonal line indicates consistently higher concentrations in the surface gray layer than in the underlying brown soil. Concentrations of arsenic and copper are up to two orders of magnitude higher in the gray layer. Concentrations for other metals, such as antimony, cadmium, iron, lead, mercury, silver, tin, and zinc, also exhibit a similar pattern by layer, as previously shown in the additional cross plots in Appendix A4. However, concentrations for some metals (e.g., manganese) do not show a distinct difference by layer.

Figures 4-9 and 4-10 show plots of arsenic and copper concentrations versus depth for all B&C 10-series and October 2001 dataset samples. These plots indicate that arsenic and copper concentrations are highest in the surface soil (i.e., <2 inches bgs), but remain elevated until approximately 12 inches bgs, where concentrations start to level off. The fact that the trends of concentration with depth generally take an exponential form suggests that arsenic and copper have been transported downward from the gray layer. As with the lateral extent of impacts, the following generalized equivalent concentrations can be discerned regarding vertical extent:

Average Depth (inches bgs)	Arsenic (mg/kg)	Copper (mg/kg)
1	3,000	100,000
6	1,000	25,000
12	300	10,000
18	100	5,000

Although the data indicate concentration trends with distance and by depth, the data do not directly allow evaluation of how these trends jointly interact. The thickness of the affected soil probably decreases as concentrations decrease with distance from the stack. This interpretation is supported by the fact that the gray layer is thickest closer to the stack (i.e., ranging from ½ to 3 inches thick) and thinner with distance from the stack (i.e., ranging from ⅛ to ¼ inch thick), as shown in Table 3-3. If the gray layer is the source of metals that were transported downward subsequent to aerial deposition, then it is logical that the depth to which soil is affected decreases with the strength of the source.

4.2.4 Nature of Contamination

The nature of soil contamination was evaluated by correlations between metals concentrations in soil. Correlation analysis was performed to identify statistically significant relationships between all metals concentrations. Correlation, when present, can strengthen interpretations of the physical system and limit detailed analysis to a few key metals rather than all metals detected. Positive correlation indicates that high values of one metal occur with high values of another metal (or conversely, that low values occur with low values). Negative correlation indicates that high values of one metal occur with low values of another metal. Data from the Golder October 2001 sampling event (Tables 3-4 and 3-5) were used to evaluate correlations between the gray and underlying brown layers, as well as within the gray layer and underlying brown layer. Significant correlation was defined as requiring a correlation coefficient $R > |0.75|$ (i.e., $R > +0.75$ or $R < -0.75$).

Metal concentrations in the gray and underlying layers are positively correlated for arsenic, cadmium, copper, and zinc. In addition, paste pH correlates positively between the two layers. All four metals are known to be present in the ore and mineral processing byproducts, and their distribution in soil layers is likely related to depositional mechanisms and subsequent soil weathering/transport processes. The correlation for pH indicates that geochemical conditions in the two layers are related; where a low surficial soil pH is observed, the pH of the deeper material will be low as well and vice versa. This suggests that gray and underlying layers represent a geochemical continuum rather than zones with discrete geochemical environments.

The occurrence of a positive correlation between the two layers does not imply that concentrations in the gray and underlying layers are identical or even similar. Use of a pairwise t test (95% probability), as well

as the previously presented cross plots (Figures 4-7 and 4-8) indicate that the gray and underlying layers are different for most metals.

Within the gray layer, there is positive correlation between a large number of metals including arsenic, antimony, cadmium, cobalt, copper, iron, lead, mercury, nickel, selenium, gold, tin, and zinc, hereafter termed the “smelter suite”. This suggests a common source for these metals, most likely mineral processing activities. Another group of metals that correlates well within the gray layer includes aluminum, strontium, and vanadium, and to a lesser extent barium, hereafter termed the “silicate suite”. This group shows a negative correlation with the smelter suite as a whole, and likely represents rock-forming silicates. Paste pH shows no significant correlation within the gray layer.

In the underlying brown layer, correlation is much reduced relative to the gray layer. The smelter suite is represented by two separate groups: 1) arsenic, cadmium, copper, and zinc, and 2) antimony, lead, and gold. This suggests that impacts from mineral processing activities are more pronounced in the surface gray layer, as corroborated by the higher average metals concentrations in the gray layer. The smelter suite metals (e.g., arsenic, cadmium, copper, and zinc) are identical to the group for which a correlation between the gray and underlying layers was identified. The correlation between the silicate suite metals is absent in the underlying layer. As within the gray layer, paste pH shows no correlation.

As part of additional exploratory data analysis, correlations between COC concentrations were also investigated using Spearman’s correlation method (appropriate for non-normal distributions). Potential correlations between COCs from all four datasets were noted. The closer to unity the *rs* value, the greater the likelihood of a correlation between results; the sign on the *rs* value indicates a negative or positive correlation. While an absolute measure of statistical significance is by definition case-specific, correlation coefficients whose “p” values (that is, the probability that the observed relationship between samples occurred “by chance”) are “small” are generally accepted as “significant”. For both correlations, p values were less than 0.0001.

The observed Spearman *rs* correlation statistic for arsenic and copper, using data from all four datasets, was +0.89 (Figure 4-11). The observed Spearman *rs* correlation statistic for arsenic and lead, using data from the B&C 1998, Golder 2001, Golder 2008 ,and Golder 2008 events, was +0.86 (Figure 4-12). These statistical tests indicate that arsenic concentrations are well correlated with copper and lead concentrations, and suggest a common source and consistent association in soil.

A “Stack Zone” line was placed on the correlation charts in Figures 4-11 and 4-12 representing 500 mg/kg arsenic, or the Stack Zone concentrations where RCML has determined that remediation is inevitable (as described in Section 2.6.2). In Figure 4-12, it is apparent that arsenic concentrations greater than 500 mg/kg correspond with the lead concentrations greater than the nonresidential SRL of 800 mg/kg. This

indicates that remediation of arsenic in the Stack Zone (>500 mg/kg arsenic) would also remediate the lead concentrations greater than the lead nonresidential SRL (800 mg/kg lead), with the exception of one sample result (located in the East Mountain Front).

4.3 Identification of Constituents of Concern

The datasets were compared to soil screening levels to identify the constituents of concern. In Arizona, soil screening is conducted with two types of predetermined (i.e., not site-specific) standards: SRLs and GPLs. SRLs are predetermined soil remediation standards that are protective of human health. GPLs are predetermined soil remediation guidance that are protective of groundwater. Not all metals with SRLs are assigned GPLs, but the GPLs for antimony, barium, beryllium, cadmium, lead, nickel, selenium, and thallium are less than their respective nonresidential SRLs. If a landowner considers the prescribed GPLs to be too restrictive for the site in question, it is allowable to develop alternative GPLs based on laboratory tests for the leachable fraction of metals in the soil (ADEQ 1996).

Tables 3-1, 3-2, 3-4, 3-5, and 3-6 provide listings of the data collected by B&C (1998 arsenic and copper, and 1998 additional constituents), and by Golder (2001 gray layer, 2001 underlying layer, February 2008 soil samples), respectively. These tables also include the nonresidential SRLs and GPLs for the constituents analyzed, and highlight the sample results where they exceed their respective regulatory limits. Table 4-2 summarizes the number of samples that exceed regulatory limits in each sampling round. Table 4-3 lists the number of samples that exceed the nonresidential SRL and minimum GPL for each land area.

The data from the Golder February 2009 sampling event are not included in this evaluation because these data were collected for confirmatory purposes. The data from the test pit sampling (April 2008) are excluded from this evaluation (except for the alternative GPL evaluation) because these data were collected for remediation design purposes, and the surface soil data are confirmatory in nature.

4.3.1 Nonresidential SRLs

The nonresidential SRL exceedances are summarized below:

- **Arsenic** – The arsenic nonresidential SRL was exceeded in 128 out of 135 B&C samples analyzed for arsenic and copper (1998), and 25 out of 25 B&C samples analyzed for additional constituents (1998). The arsenic nonresidential SRL was exceeded in ten out of ten Golder 2001 samples for the gray layer, in nine out of nine Golder 2001 samples for the underlying layer, and in 41 out of 41 samples from the Golder 2008-2009 sampling events.
- **Copper –** The copper nonresidential SRL was exceeded in ten out of 135 samples in the B&C sampling event for arsenic and copper (1998), and in six out of 25 samples in the B&C samples analyzed for additional constituents (1998). The copper nonresidential SRL was exceeded in six out of ten samples in the gray layer, but none of the nine

samples in the underlying layer (Golder 2001), and none of the 41 samples collected by Golder in 2008-2009.

- **Lead** – The lead nonresidential SRL was exceeded in two out of ten B&C 1998 samples that were analyzed for additional constituents. The lead nonresidential SRL was exceeded in six out of ten samples in the gray layer, but none of the nine samples in the underlying layer (Golder 2001). The lead nonresidential SRL was exceeded in two out of 41 samples in the Golder 2008-2009 sampling events.
- **Thallium** – The thallium nonresidential SRL was exceeded in two out of ten B&C samples analyzed for additional constituents (1998). The thallium nonresidential SRL was not exceeded in any other samples.

The nonresidential SRL exceedances by land area are summarized below:

- **East Mountain Front** Area – The arsenic nonresidential SRL was exceeded in 20 out of 20 samples. The lead nonresidential SRL was exceeded in one out of 15 samples. The nonresidential SRLs were not exceeded for copper or thallium.
- **Industrial Area** – The nonresidential SRLs were exceeded for arsenic (143 out of 149 samples), copper (22 out of 149 samples), lead (eight out of 29 samples), and thallium (two out of 29 samples).
- **North Mountain Front Area** – The nonresidential SRL for arsenic was exceeded in 38 out of 39 samples, and the nonresidential SRL for lead was exceeded in one out of 19 samples. The nonresidential SRLs were not exceeded for copper or thallium.
- **Silver King Wash Area** – The nonresidential SRL for arsenic was exceeded in 12 out of 12 samples. The nonresidential SRLs were not exceeded for copper, lead, or thallium.

The nonresidential SRL exceedances are summarized in the table below by land area:

Nonresidential SRL Exceedances by Land Area

Land Area	Arsenic	Copper	Lead	Thallium
East Mountain Front	20	0	1	0
Industrial Area	143	22	8	2
North Mountain Front	38	0	1	0
Silver King Wash	12	0	0	0
Total	**213**	**22**	**10**	**2**

4.3.2 GPLs/Alternative GPLs

The minimum GPL exceedances are summarized below:

- **Antimony** – The antimony minimum GPL was exceeded in one out of ten B&C samples (1998). The antimony minimum GPL was exceeded in five out of ten samples in the gray layer (Golder, 2001) but not in any samples from the layer underlying layer. The antimony minimum GPL was not exceeded in any other samples.
- **Arsenic** – The arsenic minimum GPL was exceeded in 48 out of 135 B&C samples analyzed for arsenic and copper, and in 11 out of 25 B&C samples analyzed for additional constituents (1998). The arsenic minimum GPL was exceeded in ten out of ten gray layer samples and three out of nine underlying layer samples from the Golder 2001 sampling event, and in two out of 41 samples in the Golder 2008/2009 sampling events.

- **Cadmium** – The cadmium minimum GPL was exceeded in one out of ten B&C samples analyzed for additional constituents (1998), and was not exceeded in any other samples.
- **Copper** – There is no minimum GPL established for copper at this time.
- **Lead** – The lead minimum GPL was exceeded in five out of 10 B&C samples analyzed for additional constituents. The lead minimum GPL was exceeded in nine out of ten samples in the gray layer, and in none of the nine samples in the underlying layer from the Golder 2001 sampling event. The lead minimum GPL was exceeded in 10 out of 41 samples from the Golder 2008/2009 sampling events.
- **Thallium** – The thallium minimum GPL was exceeded in two out of 10 B&C samples analyzed for additional constituents. The thallium minimum GPL was not exceeded in any other samples.

The GPL exceedances are summarized in the table below by land area:

GPL Exceedances by Land Area

Land Area	Antimony	Arsenic	Cadmium	Lead	Thallium
East Mountain Front Area	0	2	0	9	0
Industrial Area	6	70	1	14	2
North Mountain Front Area	0	2	0	1	0
Silver King Wash Area	0	0	0	0	0
Total	**6**	**74**	**1**	**24**	**2**

Alternative GPLs were developed using the total metals and SPLP data collected from April 2008 test pit samples, all of which were located in the IA, and the February 2009 surface soil samples in the EMF and NMF. All but two of the test pit samples selected for SPLP analysis are located within the Stack Zone, which represents the highest concentrations within the West Plant Site. The EMF and NMF samples were located in the areas where the highest observed lead concentrations occurred. The alternative GPLs calculated from these data should therefore represent the worst case scenario for evaluating the leaching potential of the elevated constituents in the West Plant Site.

Alternative GPLs were calculated for the test pit samples collected in the IA (Table 4-4), and for surface soil samples collected in the EMF and NMF (Table 4-5). The alternative GPLs were calculated as follows:

$$Alternate\ GPL\ \left(\frac{mg}{kg}\right) = 292.9\ x\ \text{minimum}\ R\ [\quad]\ x\ AWQS\ \left(\frac{mg}{L}\right)$$

Where R $\left(\frac{L}{kg}\right)$ = $\left[\frac{Total\ Metals\ Concentration\ \left(\frac{mg}{kg}\right)}{SPLP\ Metals\ Concentration\ \left(\frac{mg}{L}\right)}\right]$

The minimum ratio (R) of the total metals concentrations (from bulk soil samples) and the corresponding SPLP concentrations for each sample from each dataset are used with the corresponding aquifer water quality standard (AWQS) for each constituent (where available), and a unitless constant in accordance with methods provided by ADEQ (1996). The resulting value, in mg/kg, is compared to the maximum soil concentration for each constituent. If the alternative GPL is greater than the maximum observed concentration for a given constituent, then that constituent is not considered a COC.

For arsenic, the current Arizona AWQS of 0.05 mg/L was used in the alternate GPL calculation. In addition, the revised EPA MCL of 0.01 was used to illustrate the range of alternative GPLs corresponding to the two values.

There were six constituents in the IA that exceeded GPLs (antimony, arsenic, cadmium, copper, lead, and thallium). Copper does not have an AWQS for calculation of alternative GPL. The resulting alternative GPLs for the IA were one to two orders of magnitude higher than the maximum observed soil concentration for antimony, cadmium, lead, and thallium. In the EMF/NMF land areas, only arsenic and lead exceeded their respective minimum GPLs. The alternative GPLs for arsenic and lead in the EMF and NMF were almost one order of magnitude higher than their respective maximum observed concentrations in soil.

In the IA, none of the arsenic concentrations exceeded the alternate GPL calculated using the current Arizona AWQS of 0.05 mg/L. When the EPA revised MCL of 0.01 mg/L was used in the alternative GPL calculation, six of the 18 soil samples in the IA had arsenic concentrations that exceed the EPA alternative GPL. All of the six samples were located within the Stack Zone, where RCML has made the decision that remediation is inevitable based on elevated arsenic concentrations within that zone, as described in Section 2.6.2. Assuming the future SSSRL for arsenic is lower than the alternative GPL for arsenic, then the ground surface left after cleanup will have concentrations less than the alternative GPL and the remaining soils should not have the potential to affect groundwater.

These results indicate the possibility of impacted soil leaching to groundwater will not drive soil cleanup decisions (except in the Stack Zone where remediation will occur to remove high arsenic concentrations). The table below summarizes the alternative GPLs compared to the maximum observed concentrations for constituents that exceeded their respective minimum GPLs.

Alternative GPLs Compared to Maximum Concentrations by Land Area

Constituent	Alternative GPL (mg/kg)	Maximum Observed Concentration (mg/kg)	Maximum Observed Exceeds Alternative GPL?
Industrial Area			
Antimony	164	16	No
Arsenic (Arizona AWQS)	1,839	1,520	No
Arsenic (EPA MCL)	368	1,520	Yes [a]
Cadmium	146	5.8	No
Lead	15,289	489	No
Thallium	879	1.5	No
EMF and NMF			
Arsenic	932	291	No
Lead	41,727	514	No

[a] All soil samples locations where the alternative GPL (from EPA MCL) was exceeded are within the Stack Zone.

4.3.3 Identification of Constituents of Concern

The results from the comparisons described above indicate that arsenic, copper and lead are the COCs for the West Plant Site based on exceedances of their respective nonresidential SRLs.

Antimony is present at concentrations above its minimum GPL, and thallium is present at concentrations above its nonresidential SRL, however these constituents are not retained as COCs, as described below. The approach for evaluating and remediating lead is also presented below.

4.3.3.1 Antimony

The nonresidential SRL for antimony was not exceeded in any of the samples. The GPL for antimony (35 mg/kg) was exceeded in six out of 29 soil samples, however the alternative GPL for antimony (164 mg/kg) was not exceeded in any of the samples (Table 4-4). Since antimony did not exceed the nonresidential SRL or the alternative GPL, it is not retained as a COC for this site.

In order to ensure that antimony was adequately characterized for risk evaluation purposes, the existing antimony dataset was analyzed using VSP, in the same manner as the data adequacy for arsenic was analyzed, as described in Section 4.1.3. The preliminary action level used in the antimony VSP analysis was the RBSL of 300 mg/kg. The results, presented in Appendix D, indicate that a total of 11 samples are adequate to characterize antimony at the West Plant Site, given the input parameters described in Section 4.1.3. Since there are a total of 29 antimony results in the West Plant Site, it can therefore be concluded that antimony has been adequately characterized for risk evaluation purposes.

As with arsenic, antimony concentrations decrease with distance from the former smelter stack. As shown in Figure 4-13, antimony concentrations decrease to levels below the minimum GPL within less than 1,500 feet of the stack. The areas of elevated antimony is within the Stack Zone where RCML has made the decision that remediation is inevitable based on elevated arsenic concentrations within that zone, as described in Section 2.6.2. Therefore, it can be reasonably concluded that elevated antimony would be removed at the time of the Stack Zone remediation.

4.3.3.2 Lead

The EPA has established a default remediation goal of 400 mg/kg for lead in soil using the Integrated Exposure Uptake Biokinetic (IEUBK) model for residential remediation. However, lead can be evaluated by comparison to the Arizona nonresidential SRL of 800 mg/kg, the alternative GPL for lead, and by its correlation to arsenic and copper concentrations in soil. Because lead is well-correlated with arsenic and copper (as described in Section 4.2), and arsenic is a likely risk driver, it is reasonable to assume for the risk evaluation that areas where lead concentrations exceed the nonresidential SRL would fall within the footprint of the areas that likely require remediation for arsenic. During actual cleanup, remediation to the nonresidential SRL would be confirmed by sampling. In the EMF and NMF land areas, discrete areas of lead have been observed in concentrations that exceed nonresidential SRLs, but are lower than alternative GPLs. The elevated lead in these areas will be evaluated in more detail in the risk evaluation.

4.3.3.3 Thallium

The same ten 1998 B&C samples analyzed for antimony were also analyzed for thallium. Thallium, however, was only detected in two samples: 10-172-JDSL (a field duplicate) and 10-241-AESL, both results being identical (100 mg/kg) and also at the detection limit of several other samples in this dataset, which makes these detected results suspect. There are several arguments for eliminating thallium as a constituent of concern, as summarized below.

- Potential QA/QC Error – The two thallium results in the B&C dataset (10-172-JDSL and 10-241-AESL) are at the same concentration of 100 mg/kg. This is the same level as two of the non-detects in that same dataset (10-219-JDSL and 10-229-JDSL). This raises a suspicion that all four are likely the result of a detection limit elevated due to sample dilution. While these data were apparently not flagged by QBD during initial validation, thallium is not detected in samples from any other dataset, and all other detection limits are less than 5 mg/kg. This suggests that the 100 mg/kg results (particularly in a dilution) are not conclusive proof of the presence of that constituent.
- There are a total of 10 B&C 1998 thallium results. In addition, the Golder 2001 dataset included 18 samples, all of which were below the detection limit (5 mg/kg). Overall, 26 out of 28 samples, or 93% of the thallium data are below the detection limits, which are mostly two orders of magnitude less than two thallium results.
- Thallium was not identified as a constituent associated with smelter emission, as described in Section 4.2.4. This suggests that the source of thallium, if the detectable concentrations are valid, is likely not mineral processing activities.

- Both samples with detected concentrations of thallium are located within the Stack Zone, where RCML has decided that remediation is inevitable, and no additional evaluations are needed to revise that decision or reduce the uncertainty regarding the decision. Therefore, the locations where thallium was potentially detected will be remediated for arsenic, which will likely remove any elevated thallium at those locations.

Accepted practice, including EPA's Risk Assessment Guidance for Superfund Part A (Section 5.9.2) recommends elimination of infrequently detected chemicals under the following conditions: (1) it is detected infrequently in one or perhaps two environmental media, (2) it is not detected in any other sampled media or at high concentrations, and (3) there is no reason to believe that the chemical may be present (EPA 2001). Therefore, since thallium is infrequently detected, and there is little reason to believe that thallium is associated with smelter emissions, thallium is not retained as a COC.

4.3.3.4 Constituents of Concern

To conclude, the COCs for the West Plant Site are:

- Arsenic
- Copper
- Lead

These constituents will be evaluated in the risk evaluation to identify SSSRLs for each land area.

4.4 Surface Water Evaluation

ADEQ has collected surface water samples from Silver King Wash as part of its ongoing Total Daily Maximum Load (TMDL) investigation for Queen Creek. The results for the portion of Silver King Wash that traverses the northwest corner of the West Plant Site are presented in Table 4-6. The sample locations are all located outside of the boundary of the West Plant Site (Figure 1-3).

There are several designated uses applicable to Queen Creek, and a TMDL analysis of that creek is ongoing. However there are no designated uses established for Silver King Wash. Therefore the surface water results for Silver King Wash are not compared to regulatory standards in Table 4-6.

Analytical results for metals from surface water samples collected by ADEQ near Silver King Wash show the presence of arsenic, copper, and lead in the dissolved fraction. Calcium and magnesium are also present in the dissolved fraction, but these constituents are hardness indicators and are not considered constituents of concern. While arsenic, copper, and lead are "smelter suite" metals, as described in Section 4.2.4, the remaining metals in that suite, historically considered characteristic of smelter impacts (e.g. antimony, cadmium, and zinc), were not detected in the samples from the wash. Nor is a smelter source supported by the wind rose data (Figure 2-6), which show predominant winds to the northeast and southwest, not northwest toward Silver King Wash. Silver King Wash drains a historic mining area approximately two miles upstream of the northwest boundary of the West Plant Site, suggesting that

constituents in surface water in Silver King Wash may be attributed to sediment transport from upstream sources.

The TMDL results do not indicate whether smelter affected soil at the West Plant Site in the vicinity of Silver King Wash causes or threatens to cause a violation of surface water quality standards, under AAC R18-7-203(B)(1). In advance of the completion of the TMDL investigation, it is not possible to determine whether a remedial action for soil is needed that anticipates: (i) the copper load, if any, that will be allocated to Silver King Wash as a tributary to Queen Creek; (ii) the possibility that the TMDL implementation plan will assign a copper load reduction target for the wash; or (iii) the possibility that the TMDL implementation plan will include an implementation action that implicates the smelter affected soil along the wash within RCML's property. For these reasons, the determination, under the VRP, of SSSRLs for the smelter affected soil in the Silver King Wash Area should occur as a function of risk to human health at this time (risk of leaching to groundwater not being a driver of SSSRLs, as explained above), while deferring possible further action on the soil as a function of its potential to contribute to a violation of surface water quality standards until after the issuance of the TMDL implementation plan.

5.0 CONCEPTUAL SITE MODEL

A conceptual site model was developed to show the relationships between waste sources, release mechanisms, affected media, pathways, exposure routes, and receptors at a site. The current and future land use (industrial) and the varying levels of accessibility among the four land areas were used to identify potential receptors and to develop potential exposure scenarios for each land area. The conceptual site model developed for the West Plant Site is shown in Figure 5-1.

5.1 Primary Waste Sources

The elevated soil constituents at the West Plant Site originated from mineral processing activities. Possible sources include ore, tailings, slag, flue dust, and direct emissions. During operations, emissions consisted of particulate emissions from the smelter stack and fugitive emissions from tailings as well as other mineral processing activities, including crushing and concentrating. The smelter stack, however, was the largest source of emissions.

5.2 Secondary and Tertiary Sources and Release /Transport Mechanisms

Particulate and fugitive emissions were transported by air and deposited on soil surrounding the source areas. The dispersion of constituents contained in the emissions is dependent on several atmospheric conditions, including wind direction, duration, speed, and precipitation events. The deposition of airborne particulate and fugitive emissions typically results in a higher mass of material deposited on soil closer to the source. Thus, constituent concentrations are typically highest near the source areas and decrease with increasing distance from the source areas, although this general pattern can be complicated by rugged topography.

In the processing area, direct deposition of mining wastes (e.g., ore, overburden, tailings, and slag) may have occurred. These materials may have been resuspended in air and redeposited onto the surrounding surface soil.

As described in Section 4.3.2, alternative GPLs were calculated to evaluate the potential effects to groundwater from constituents in surface soil with concentrations that exceeded minimum GPLs. The results showed that the alternative GPL values were all one to two orders of magnitude higher than the maximum soil concentrations observed for each of the constituents evaluated, except for arsenic. All soil sample locations where arsenic exceeded the alternative GPL are within the Stack Zone where the ground surface remaining after cleanup should have concentrations less than the alternative GPL. Therefore, leaching smelter constituents to groundwater does not play a role in the determination of the SSSRLs.

There are no perennial surface water bodies on the West Plant Site. RCML manages stormwater from most of the site under its NPDES permit and regularly pumps stormwater from the Indian Ponds to

Tailings Pond 6 rather than discharging from Outfall 001 (although RCML is permitted to do so in accordance with the permit's discharge standards). The data currently available, including the TMDL data received from the ADEQ, do not indicate the presence or absence of a surface water mechanism for transport of smelter-derived constituents from the portion of the West Plant Site abutting Silver King Wash into Queen Creek.

5.3 Affected Media

The affected media are soil and air.

The two media of interest for risk evaluation are as follows:

- Soil – Particulate and fugitive emissions from the source areas are released to soil surrounding the site by airborne transport and deposition.
- Air – A small quantity of constituents may be temporarily released into the air as respirable particles by airborne transport and as resuspended particles from the soil. The constituents of concern are all inorganic constituents and are not volatile.

5.4 Exposure Routes

Exposure routes are the mechanisms by which receptors come into contact with constituents. For the West Plant Site, there are two direct exposure routes: incidental ingestion of affected soil and dermal contact with affected soil. There is one indirect exposure route: inhalation of constituents resuspended from affected soil into air.

5.5 Potential Receptors

The potential receptors for constituents at the West Plant Site are summarized below for each land area. The land use is industrial; therefore industrial workers may be present on any of the land areas. However, the frequency and duration of access will vary with each land area.

Although public access to any of the land areas on the West Plant Site is illegal and restricted, it is possible for trespassers to enter the land areas.

The following are the receptors and exposure scenarios identified for each land area.

5.5.1 East Mountain Front Area

Entry onto the East Mountain Front is controlled on the west side, and open on the east side. However, rugged terrain on either side largely limits entry to this area. Adult industrial workers may infrequently visit this area. Trespassers who may enter illegally are teenagers and adults.

The receptors and exposure scenarios evaluated for this land area, accordingly, are:

- Industrial Worker, Low Level Use (adults)
- Trespasser, Low Level Use (teenagers to adults)

5.5.2 Industrial Area

Adult workers for RCML mining activities are present in this area during active shift hours. Industrial activities are assumed to be mining related. The IA is a working minesite, and workers in this area operate under Mine Safety and Health Administration (MSHA) standards that have been implemented to reduce potential health hazards, and promote improved safety and health conditions on minesites (MSHA 2008). Part of these standards requires workers to be trained in safe work practices to reduce or eliminate exposures to health hazards. Because miners are held to these standards, they are likely to have substantially reduced exposures to soil than a typical industrial worker.

Public access is illegal and restricted. Fencing and security prevent entry onto the site from the south side of this area, thus preventing inadvertent access to the Industrial Area from the populated areas in the vicinity. Entry from the east side is difficult due to the topography and the rugged terrain, and the remoteness of the access points from populated areas. For the same reasons, entry is difficult from the west and north sides of the IA. The frequency and duration of the entry are presumably much lower than for industrial workers because of the restricted access. Teenagers and adults are the age levels of trespassers that may enter this area. Younger children will not likely venture into this area due to the difficulty in terrain and the security gates.

The receptors and exposure scenarios evaluated for this land area, accordingly, are:

- Industrial Worker, Regular Work Shift (adults)
- Trespasser, Low Level Use (teenagers to adults)

5.5.3 North Mountain Front Area

The North Mountain Front is not readily accessible, and the steep topography and rocky outcrops are prohibiting to all but the most physically fit hikers or climbers. There are few points of access to this area. Teenagers and adult trespassers may access this area from the limited points of access. Children and preteens are unlikely to access this area due to the ruggedness of the terrain and vegetation. Because of the rugged terrain, it is unlikely that this area would be used regularly by trespassers.

The receptors and exposure scenarios evaluated for this land area, accordingly, are:

- Industrial Worker, Infrequent Use (adults)
- Trespasser, Infrequent Use (teenagers to adults)

5.5.4 Silver King Wash Area

Public access to the Silver King Wash Area is illegal and restricted. However, trespass may occur, and all-terrain vehicle enthusiasts have been observed in this area. Due to the remoteness of the area, it is unlikely that very small children (i.e., less than six years old) would frequent the area. People from pre-teenagers (6-12 years of age) to adults may enter this area unintentionally while trespassing in the wash area.

The receptors and exposure scenarios evaluated for this land area, accordingly, are:

- Industrial Worker, Low Level Use (adults)
- Trespasser, Low Level Use (pre-teenagers to adults)

5.6 Remedial Objectives

Remedial objectives for the West Plant Site were developed to address the COCs, the media of concern, and the potential exposure pathways. The remedial objectives for the West Plant Site are as follows:

- Prevent human incidental ingestion and direct dermal contact with COCs in surface soil at concentrations that pose an excess cancer risk greater than 10^{-5} or a hazard index greater than 1.
- Prevent human inhalation of COCs resuspended from surface soil to air that pose an excess cancer risk greater than 10^{-5} or a hazard greater than 1.

Remedial objectives are not stated in terms of the potential of COCs to leach to groundwater, for the reasons stated in sections 4.3.2 and 5.2, above.

Remedial objectives are not stated in terms of the potential of COCs to affect surface water quality, in advance of the completion of the TMDL proceeding for Queen Creek, for the reasons stated in sections 4.4 and 5.2, above.

5.7 Community Involvement

RCML proposes to work with the local community to provide information and/or presentations regarding upcoming submittals, decisions and remedial activities at the West Plant Site. For any activities that may result in noise, light, odor, dust and other adverse impacts off of the site, RCML will provide general public notice to those who may be affected. Such notice will not occur until remediation activities commence at the West Plant Site. Therefore, community notification plans will be outlined in a later work plan detailing the proposed remedial action.

6.0 DEVELOPMENT OF SITE-SPECIFIC SOIL REMEDIATION LEVELS

RCML will conduct a PHHRE to develop risk-based SSSRLs. These SSSRLs will be developed to achieve the remedial objectives specified in section 5.6, above. The PHHRE results will be presented in a SSSRL Report for submittal to VRP.

A probabilistic risk evaluation utilizes distributions (ranges of values) for one or more parameters used to calculate exposure. This differs from a deterministic risk evaluation (such as was presented in Golder 2008a, b), where single values (point estimates) that reflect the "reasonable maximum exposure" are used for all parameters. Since the PHHRE uses probability distributions, it more effectively characterizes the variability and/or uncertainty inherent in each exposure variable. The output of the PHHRE will be a probability distribution of soil remediation levels versus percentiles, such that a percentile can be selected (e.g., 5^{th} percentile) to identify the associated soil remediation level that achieves the remedial objectives for a particular COC.

The PHHRE will address the receptors associated with each land area in accordance with the Conceptual Site Model. The soil remediation level models defined in the PHHRE will incorporate a combination of distributions and point values to represent site-specific, physiological, and chemical-specific parameters. Those parameters selected for specific development of parameter distributions will be based on the results of an initial sensitivity analysis. The purpose of the initial sensitivity analysis is to identify those parameters having the greatest influence on the magnitude of the calculated remediation levels to ensure that the variability and/or uncertainty associated with these "sensitive" parameters is well characterized through the development of statistical distributions.

The PHHRE will be conducted in accordance with EPA risk assessment guidance (EPA 1989, 2001), and Arizona Department of Health Services guidance (2003) as applicable. The output of the PHHRE will be calculated SSSRLs for each land area, and these will be the basis for developing site remediation alternatives.

6.1 Problem Formulation

6.1.1 Previous Site Assessments

Previous soil sampling at the site has been conducted since 1998 as described in Section 3.0. Concentrations in soil were compared to the nonresidential SRLs to determine where elevated concentrations occur. The metals with concentrations that exceeded nonresidential SRLs are summarized in Section 4.3.1. The resulting COCs were arsenic, copper and lead.

6.1.2 Exposure Scenarios

Given the size and complexity of the site, four land areas have been established (see Section 2.6 and Figure 2-1). The probable future receptors for each land area, as described in Section 5.5, are the basis for identifying site-specific exposure scenarios in each land area. These exposure scenarios are detailed in Section 5 and shown in Figure 5-1. Exposure routes for each receptor include ingestion of soil, dermal absorption from soil, and inhalation of particulates.

The receptors vary for each of the four land areas, and are described in Section 5.5. Briefly, adult industrial workers may be exposed in each of the land areas, to varying degrees. Trespassers in each of the areas range in age from pre-teenagers to adults. The youngest potential receptor group for each land area will be evaluated in the PHHRE because that age group represents the most sensitive receptor (intake relative to bodyweight). For cancer risks, estimated lifetime cancer risks will be summed for the youngest age group through the adult age group. In each land area, the sum total of lifetime exposures for the receptor groups present will add up to at least 30 years, which is a conservative estimate of the total years each individual would remain in the area conducting the same activities related to exposure to site soils.

6.2 Methods to be Used in the PHHRE

Since concentrations of some metals in soil samples collected to date have exceeded nonresidential SRLs, the purpose of this PHHRE will be to develop risk-based SSSRLs. The standard risk equations will be used with probability distributions of parameters to solve for the soil concentration that corresponds with a given percentile for a given risk level (e.g., hazard quotient of 1.0, cancer risk ranging from 10^{-4} to 10^{-6}). The PHHRE will present the calculated SSSRL as a probability distribution based on the input parameter distributions. The results will be presented in a SSSRL Report, which will be used to develop a remedial action work plan.

To determine SSSRLs for each of the receptor groups listed in Section 5.5, distributions of one or more exposure parameters will be used. Overall, guidance from EPA (1989, 2001), Oregon Department of Environmental Quality (1999), and Burmaster and Anderson (1994) will be followed to guide the probabilistic analysis and documentation. There is a concurrent probabilistic risk assessment developed for the Northwest Study Area in the town of Superior, Arizona, being conducted on behalf of BHP Copper. The parameter distributions developed for use in Northwest Study Area probabilistic risk assessment were reviewed for applicability to the West Plant Site PHHRE.

6.2.1 Exposure Parameters

Standard intake and risk equations (EPA 1989) for reasonable maximum exposures will be modified to calculate the SSSRL. The exposure parameters for each exposure scenario will be taken from a variety of regulatory guidance and similar smelter sites, since no default parameter distributions have been

proposed by ADHS or EPA to date. Detailed information on selected parameter distributions will be presented in the SSSRL report, including, at a minimum; the shape of the full distribution, mean, standard deviation, minimum, 5th percentile, median, 95th percentile, and maximum values. Correlations between parameter distributions will be presented in the SSSRL report (e.g., positive correlation between body weight and skin surface area). Sources consulted in the development of the West Plant Site PHHRE will include:

- Oregon Department of Environmental Quality (ODEQ) Guidance for Use of Probabilistic Analysis in Human Health Risk Assessments – This guide presents typical distributions for exposure factors commonly used in HHPRAs (ODEQ 1999).
- Arizona Department of Health Services (ADHS) Deterministic Risk Assessment Guidance – The default parameters presented in the ADHS guidance were used as default parameters where appropriate. The ADHS guidance does not provide parameters for recreational or trespasser scenarios (ADHS 2003).
- Risk Assessment Guidance for Superfund – EPA Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, Part A (EPA 1989).
- Risk Assessment Guidance for Superfund – Process for Conducting Probabilistic Risk Assessment (EPA 2001)
- EPA Standard Default Exposure Factors – The default parameters presented in this EPA guidance document provides recreational exposure factors (EPA 1991).
- EPA Exposure Factors Handbook – This EPA handbook provides statistical data on various exposure factors (EPA 1997a).
- Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (EPA, 2002a).
- Risk Assessment Guidance for Superfund Supplemental Guidance for Dermal Risk Assessment (Part E) – The EPA developed Part E to address human health risk related to dermal exposures (EPA 2004).
- Estimation of Relative Bioavailability of Arsenic in Soil and Soil-Like Materials by In Vivo and In Vitro Methods (EPA 2005).
- ADEQ Correspondence and literature review - Arsenic bioavailability will be determined using available published studies. A percent bioavailability value was recommended by ADEQ in their May 9, 2008 letter (Clark 2008b).
- Soil Dermal Arsenic Absorption Studies – A literature search will be performed to determine dermal absorption values for arsenic from soil.
- Preliminary Remediation Goals (PRGs) for Addressing Risks to Human Health from Exposures to Chemicals in Kennecott Soils (CDM 1999) – This report presents PRGs for the Kennecott Utah Copper site in Salt Lake County, Utah. The PRGs were developed for similar types of receptors as those identified at the West Plant Site. Some of the exposure assumptions developed for the Kennecott Soils site will be reviewed for applicability in the West Plant Site PHHRE.

6.2.2 Toxicity Values

The potential cancer risks from the COCs will be evaluated using oral and inhalation cancer slope factors, and using oral and inhalation reference doses for non-cancer toxicity. The toxicity values used in the PHHRE will not be established as distributions but rather as discrete point values.

The sources of toxicity information will be taken from:

- Integrated Risk Information System (IRIS) – A database of risk information that is managed by the EPA (EPA 2008). This database undergoes rigorous peer review and is maintained by EPA at a high level of quality.
- Heath Effects Summary Tables (HEAST) – The HEAST tables are secondary sources of toxicity data (EPA 1997b).
- Hurley HHRA – Chino Mines Company evaluated potential human health effects in the town of Hurley from historical mineral processing operations at the Hurley smelter as part of the Administrative Order on Consent with the New Mexico Environment Department. As part of this evaluation, the New Mexico Environment Department retained Gradient Corporation (Gradient) to conduct a human health risk assessment for the town of Hurley (Gradient 2000). In order to evaluate human health risks for copper in Hurley soil, Gradient developed an acceptable exposure level for copper based on available literature and studies on copper toxicity.

6.2.3 Health Effects Characterization

The exposure values will be used to characterize the chronic daily intakes for potential cancer and non-cancer health effects. The distribution of intakes will be combined with the point estimates of toxicity to calculate potential SSSRLs.

For risk management decisions based on a cancer endpoint (typically a “driver” for cleanup), the point of departure is typically an excess lifetime cancer risk ranging between 10^{-4} (i.e., 1 in 10,000) and 10^{-6} (i.e., 1 in 1,000,000). The SSSRLs will be presented for the 10^{-5} risk level for each land area. There is only one carcinogen (arsenic) associated with the site, so additive effects from several carcinogenic constituents will not be applicable.

For constituents with non-cancer toxicity endpoints, SSSRLs will be calculated assuming a hazard quotient of 1.

6.2.4 Site-Specific Soil Remediation Level Calculations

The PHHRE will employ a Monte Carlo analysis using the software program @Risk (v 5.5.1, 2010) following EPA (2001). Through this procedure, random values will be statistically sampled from the exposure parameter distributions and used in the SSSRL calculations. This “sampling” is repeated 10,000 times for each scenario, and the calculated SSSRLs are presented as probability distributions and cumulative probability distributions. The probability density distribution shows the probability that a given soil concentration is the result of the SSSRL calculation given the input variable distributions calculated

10,000 times. The cumulative distribution function shows the percentile values from the probability distribution function. This assessment will be conducted in accordance with Arizona site-specific remediation standards (A.R.S. R18-7-206 (B)(2)), which states that the probabilistic methodology shall be no less protective than the 95th percentile upper bound estimate of the distribution. This corresponds with the 5th percentile of the SSSRL distribution (EPA 2001). The SSSRL distributions will also be compared to the soil concentrations occurring in each of the land areas (see Section 6.2.4) as part of the SSSRL report.

An example SSSRL calculation output is shown in Figure 6-1 as both a probability distribution function and a cumulative distribution function. In this hypothetical example, the 5th percentile of the probability distribution for Area 'X' and chemical 'Y' was 50 mg/kg in soil. This value is lower than (i.e., protective of) 95% of the calculated SSSRLs from the distributions of input variables. This line appears at the same soil concentration on both the probability distribution function and the cumulative distribution function. In this example, the soil calculation was run 10,000 times where values were selected from the probability distributions of the input variables 10,000 times and the resulting soil concentration calculated. This resulted in a distribution of calculated soil concentrations which could be compared with measured concentrations of chemical 'Y' in area 'X' to determine if remedial actions would be necessary.

Another result of the @Risk calculations will be a sensitivity analysis. The goal of a sensitivity analysis is to rank the input variables on the basis of their contribution to variance in the calculation to determine which variables are driving the SSSRL calculation. @Risk uses multivariate stepwise regression and rank order correlation in the sensitivity analysis. These results also will be presented in the SSSRL report.

The results of the PHHRE will be qualified by a discussion of the uncertainties associated with the assumptions used to develop exposure estimates. The level of confidence in the exposure estimates, toxicity, and risk characterization estimates will be discussed. The major factors associated with the uncertainties will be summarized. The factors that may reduce the uncertainties will be summarized, along with recommendations on any potential further activities that could be implemented to support the reduction of uncertainty.

6.2.5 Exposure Concentrations

The concentrations of the COCs in soil will be developed based on the data presented in Section 3.0. Surface soil concentrations within each land area will be compiled to develop summary statistics. The data will include only surface soil data that were sieved to the <250 µm particle size fraction, representing the size fraction that is likely to adhere to human skin and be available for incidental ingestion.

In accordance with the ADHS guidance (2003), the 95% upper confidence limit (UCL) of the arithmetic mean concentration in each exposure area will be used to represent exposure concentrations in soil. The 95% UCL of the mean will be calculated using the ProUCL software identified in EPA's guidance (2002b). The ProUCL software identifies the distribution of the data and the appropriate equation to use to calculate the 95% UCL of the mean concentration based on the distribution of the data.

7.0 SCHEDULE AND CLOSING

The SSSRLs are necessary to prepare a Remedial Action Workplan (RAW) for the West Plant Site. The following table summarizes the schedule to develop the SSSRLs and prepare the RAW.

Approximate Schedule for Submittals

	Document	Activity	Approximate Schedule (Duration)
1	Draft Site Characterization Report	Submittal to ADEQ	January 2011
2	Draft Site Characterization Report	Comments received from ADEQ	February 2011 (4 weeks)
3	Final Site Characterization Report (or addendum to draft report)	Submittal to ADEQ	November 2011
4	Draft SSSRL Report	Submittal to ADEQ	January 2012 (six weeks)
5	Draft SSSRL Report	Comments received from ADEQ	February 2012 (4 weeks)
6	Final SSSRL Report (or addendum to draft report)	Submittal to ADEQ	March 2012 (2 weeks, unless comments are extensive)
7	Final SSSRL Report (and SSSRLs)	ADEQ Approval of SSSRL Report and SSSRLs	April 2012 (4 weeks)
8	Draft Remedial Action Workplan	Submittal to ADEQ	July 2012 (12 weeks)
9	Draft Remedial Action Workplan	Comments received from ADEQ	August 2012
10	Final Remedial Action Workplan	Submittal to ADEQ	September 2012

This report was prepared by Golder on behalf of RCML for submittal to the ADEQ VRP. If there are any questions and comments, they may be directed to Casey McKeon, Environmental Supervisor at RCML, or to the signatories below at Golder.

GOLDER ASSOCIATES INC.

Diane Crawford
Associate Senior Consultant

Kent R. Johnejack, PE
Associate Senior Consultant

DC/KRJ/sb

8.0 REFERENCES

Arizona Department of Environmental Quality. (ADEQ). 1996. *A Screening Method to Determine Soil Concentrations Protective of Groundwater Quality.* Prepared by the Leachability Working Group of the Cleanup Standards/Policy Task Force. September.

Arizona Department of Health Services. (ADHS). 2003. *Deterministic Risk Assessment Guidance.* Prepared by the ADHS Office of Environmental Health. May 16.

Battelle and Exponent. 2000. *Guide for Incorporating Bioavailability Adjustments into Human Health and Ecological Risk Assessments at U.S. Navy and Marine Corps Facilities*. Part 2: *Technical Background Document for Assessing Metals Bioavailability.* Prepared for Naval Facilities Engineering Services Center, Port Hueneme, CA and Naval Facilities Engineering Command, Engineering Field Activity West, San Bruno, CA. July.

Brown & Caldwell. (B&C). 1998. *Draft Remediation Action Plan, BHP Superior Operations,* Prepared for BHP Copper, Superior Operations, Superior, Arizona. November 2.

Burmaster, D.E. and P.D. Anderson. 1994. *Principles of good practice for use of Monte Carlo techniques in human health and ecological risk assessment*. Risk Analysis. 14(4):477-481.

Canty, J.M, and M.N. Greeley. 1987. *History of Mining in Arizona, Volume I, Chapter 9, The History of Smelting in Arizona*. Mining Club of the Southwest Foundation. Tucson, Arizona.

Canty, J.M, and M.N. Greeley. 1991. *History of Mining in Arizona, Volume II, Chapter 9, The History of Mining at Superior*. Mining Club of the Southwest Foundation. Tucson, Arizona.

CDM. 1999. Preliminary Remediation Goals for Addressing Risks to Human Health from Exposures to Chemicals in Kennecott Soils, Kennecott Utah Copper Site, Kennecott, Utah. Prepared for U.S. EPA, Region VIII, Contract No.: 68-W5-0022, Work Assignment No.: 012-RK-ED-08-96. Prepared by CDM Federal Programs Corporation, Golden, Colorado. December.

Clark, D. 2008a. Memorandum from D. Clark of Ninyo & Moore to J. Emde of ADEQ dated January 2.

Clark, D. 2008b. Memorandum from D. Clark of Ninyo & Moore to C. McKeon of RCML dated May 9.

EPA. 1989. *Risk Assessment Guidance for Superfund, volume 1, Human Health Evaluation Manual (Part A), Interim Final*. EPA/540/1-89/002. Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington DC, December 1989.

EPA. 1991. *Human Health Evaluation Manual*, Supplemental Guidance, Standard Default Exposure Factors, Interim Final. OSWER Directive 9285.6-03, Office of Emergency and Remedial Response, U.S. EPA, Washington DC, March 25, 1991.

EPA. 1997a. *Exposure Factors Handbook, Volume 1, General Factors*, EPA/600/P-95/002Fa.: U.S. Environmental Protection Agency, Office of Research and Development, National Center for Environmental Assessment, U.S. EPA, Washington, DC. August 1997.

EPA 1997b. *Health Effects Summary Tables*. Office of Emergency and Remedial Response, U.S. EPA, Washington, DC.

EPA. 2001. *Risk Assessment Guidance for Superfund: Volume III – Part A, Process for Conducting Probabilistic Risk Assessment*. OSWER 9285.7-45. Office of Emergency and Remedial Response, U.S. EPA, Washington, DC. December.

EPA. 2002a. *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*, December, OSWER 9355.4-24. Office of Emergency and Remedial Response, U.S. EPA, Washington, DC. December.

EPA. 2002b. *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*, December 2002, OSWER 9285.6-10. Office of Emergency and Remedial Response, U.S. EPA, Washington, DC. December.

EPA. 2004. *Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final*. EPA/540/R/99/005. OSWER 9285.7-02EP. Office of Superfund and Technology Innovation, U.S. EPA, Washington, DC. July.

EPA. 2005. *Estimation of Relative Bioavailability of Arsenic in Soil and Soil-Like Materials by In Vivo and In Vitro Methods*. Prepared by U.S. EPA, Region 8, Denver, CO, with technical assistance from Syracuse Research Corporation, Denver, CO. March.

EPA. 2008. Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iriswebp/iris, accessed October 7, 2010.

Golder Associates Inc. (Golder) 2005. *Aquifer Protection Permit Application, Volume 3 – Appendices, West Plant Site, Superior Mine, Superior, Arizona*. June 24.

Golder. 2007. *Work Plan, Human Health Risk Assessment, West Plant Site, Superior, Arizona. Submitted to Resolution Copper Mining LLC, Superior, AZ*. Submitted by Golder Associates, Redmond, WA. November 20.

Golder. 2008a. *Human Health Risk Assessment Report for the West Plant Site, Superior, Arizona. Submitted to Resolution Copper Mining LLC, Superior, AZ*. Submitted by Golder Associates, Redmond, WA. July 16.

Golder, 2008b. *Corrections to the July 16, 2008 Human Health Risk Assessment Report for the West Plant Site, Superior Arizona*. Partial resubmittal to ADEQ of replacement Chapters 7 and 8, Appendix C, and all tables. Submitted by Golder Associates, Redmond, WA. September 11.

Gilbert, O. Richards. 1987. *Statistical Methods for Environmental Pollution Monitoring John Wiley & Sons, Inc.*

Gradient. 2000. *Human Health Risk Assessment, Hurley Soils Investigation Unit*. Prepared for the State of New Mexico Environment Department. Prepared by Gradient Corporation, Cambridge, MA. February 22, 2000.

Hendricks, David M. Arizona Soils. *A Centennial Publication of the University of Arizona College of Agriculture.* 1985. Higgins, I., K. Welch, M. Oh, and C. Burchfiel. 1982. Arsenic exposure, smoking, and respiratory cancer in copper smelter workers. Arch. Environ. Health 37(6):325(11).

MSHA. 2008. Online: http://www.msha.gov. *Mine Safety and Health Administration*, Arlington, Virginia, accessed October 7, 2010.

Oregon Department of Environmental Quality (ODEQ). 1999. *Guidance for Use of Probabilistic Analysis in Human Health Risk Assessments*. Waste Management & Cleanup Division; Cleanup Policy & Program Development Section, Portland, OR. March.

Peterson, D.W. 1969. *USGS Geologic Quadrangle Map GQ-818*, Superior Quadrangle, Arizona. Scale 1:24,000, 1 Plate.

Resolution Copper Mining LLC (RCML). 2007. Letter to Jeff Emde, Arizona Department of Environmental Quality. *Smelter Town Area, Area-wide Aquifer Protection Permit No. P-101703, Superior Mine, Superior Arizona*. Dated October 2.

RCML. 2010. Compliance Item No. 1 – Second Quarter 2010 Groundwater Contour Map, Area-Wide Aquifer Protection Permit No. P-101703, West Plant Site, Superior, Arizona. Resolution Copper Mining LLC, Superior, Arizona. August 11.

University of Arizona on the Web. 2008. Southwest Library. 2008. Online: southwest.library.arizona.edu/azso/body.1_div.4.html, accessed October 7, 2010.

U.S. Environmental Protection Agency (see EPA).

TABLES

Table 2-1: Monthly and Annual Average Climatic Data

Time Period	Total Evaporation (inch)	Total Precipitation (inch)	Average Temperature (ºC)	Maximum Temperature (ºC)	Minimum Temperature (ºC)	Average Relative Humidity (%)	Maximum Relative Humidity (%)	Minimum Relative Humidity (%)	Average Wind Speed (mph)	Average Wind Speed (m/s)
Annual Climate Data										
2002	34.93	4.92	22.1	40.4	2.3	32.7	93.7	1.6	7.0	3.2
2003	90.41	13.68	22.2	44.5	-1.0	30.9	97.8	1.6	6.5	3.0
2004	77.88	15.24	21.1	40.7	0.1	34.9	99.0	1.7	7.0	3.2
2005	16.64	18.81	14.8	32.3	2.7	47.8	99.3	3.5	6.2	3.0
2006	73.17[a]	12.71	21.8	44.0	-0.1	34.6	99.9	1.6	6.5	2.9
2007	18.36[b]	4.90[c]	16.4	35.1	-4.4	37.4	99.9	4.0	7.2	3.2
2008[d]	---	---	---	---	---	---	---	---	---	---
2009[d]	106.51	5,71	23.9	34.8	4.4	27.0	81.7	7.5	6.9	3.1
2010	74.34	12.55	22.44	34.23	6.28	29.92	88.92	8.17	6.9	3.1
Average	**61.53**	**11.83**	**20.59**	**38.26**	**1.29**	**34.40**	**95.03**	**3.71**	**6.77**	**3.09**
Monthly Climate Data										
1/2009[d]	---	---	---	---	---	---	---	---	---	---
2/2009[d]	---	---	---	---	---	---	---	---	---	---
3/2009[d]	---	---	---	---	---	---	---	---	---	---
4/2009	6.97	---	19.1	27.8	8.9	25.9	78.9	9.5	6.9	3.1
5/2009	13.72	0.21	26.5	31.3	17.6	22.4	76.8	11.7	6.5	2.9
6/2009	14.96	0.06	27.5	32.5	23.0	21.2	36.3	8.1	6.5	2.9
7/2009	16.48	0.63	31.9	34.8	28.5	29.3	47.3	15.7	6.5	3.0
8/2009	15.61	0.12	31.2	34.6	25.6	24.0	60.0	11.9	6.5	2.9
9/2009	13.61	2.33	28.2	31.0	24.4	27.8	60.5	9.6	7.8	3.5
10/2009	10.80	0.00	20.6	29.7	8.1	25.7	47.9	7.5	6.5	3.0
11/2009	8.73	0.48	18.5	25.9	10.4	24.8	75.0	10.6	7.8	3.5
12/2009	5.63	1.86	10.1	15.4	4.4	41.4	81.7	11.7	6.9	3.1
1/2010	4.17	2.17	12.7	15.9	7.0	33.9	84.4	13.8	8.5	3.8
2/2010	3.28	10.38	11.5	16.2	6.3	49.0	88.9	21.8	6.9	3.1
3/2010	4.94	2.19	16.6	20.4	12.5	26.7	63.0	15.4	6.9	3.1
4/2010	10.32	0.04	18.0	23.8	9.7	27.5	56.6	11.7	6.5	3.0
5/2010	13.49	0.02	22.5	27.0	15.2	16.8	25.2	11.5	6.3	2.8
6/2010	16.02	0.04	29.4	33.9	21.8	15.7	25.0	8.2	6.5	2.9
7/2010	10.67	4.64	30.5	34.2	23.5	37.0	76.7	15.6	7.4	3.3
8/2010	11.47	1.11	30.2	33.3	25.6	36.8	61.1	18.6	6.5	3.0
Average	**10.64**	**1.64**	**22.64**	**27.52**	**16.02**	**28.58**	**61.49**	**12.54**	**6.91**	**3.11**

Notes:

[a] Partial year summary (limited datagaps in April, July, September, November and December not exceeding 1 week each).

[b] Partial year summary (January 1 to May 31, 2007 with part of April and much of May data missing).

[c] Partial year summary (January 1 to May 31, 2007).

[d] The West Plant Site MET station was inoperational from May 2007 to April 2009. No data exist for 2008.

mph = miles per hour

m/s = meters per second

Table 2-2: Sample Collection Field Log, North Mountain Front

Hiking Start Time	Route	Hiking End Time	Time Spent Hiking	Approximate Distance Covered (ft)	Minutes per Segment	Feet per Minute	Day
15:00	Truck - NMF-07HHRA-009	16:30	1:30	1,800	90	20	1
16:35	NMF-07HHRA-009 - NMF-07HHRA-007	17:10	0:35	750	35	21	
17:15	NMF-07HHRA-007 - Truck	18:15	1:00	2,550	60	43	
8:45	Truck - NMF-07HHRA-006	12:30	3:45	3,300	225	15	2
12:35	NMF-07HHRA-006 - NMF-07HHRA-008	13:15	0:40	790	40	20	
13:20	NMF-07HHRA-008 - NMF-07HHRA-010	14:00	0:40	790	40	20	
14:05	NMF-07HHRA-010 - NMF-07HHRA-011	14:50	0:45	790	45	18	
14:55	NMF-07HHRA-011 - NMF-07HHRA-013	15:35	0:40	790	40	20	
15:40	NMF-07HHRA-013 - Truck	15:45	0:05	300	5	60	
9:00	Truck - NMF-07HHRA-014	9:15	0:15	900	15	60	3
9:20	NMF-07HHRA-014 - NMF-07HHRA-012	9:40	0:20	790	20	40	
9:45	NMF-07HHRA-012 - NMF-07HHRA-015	10:10	0:25	1,125	25	45	
10:15	NMF-07HHRA-015 - Truck	10:30	0:15	1,800	15	120	
11:30	Truck - EMF-07HHRA-002	11:50	0:20	1,800	20	90	
12:10	EMF-07HHRA-002 - EMF-07HHRA-001	12:30	0:20	690	20	34	
12:35	EMF-07HHRA-001 - Truck	12:40	0:05	300	5	60	
13:10	Truck - EMF-07HHRA-003	13:15	0:05	100	5	20	
13:15	EMF-07HHRA-003 - Truck	13:20	0:05	100	5	20	
14:05	Truck - EMF-07HHRA-004	14:45	0:40	750	40	19	
14:50	EMF-07HHRA-004 - EMF-07HHRA-005	15:20	0:30	875	30	29	
15:25	EMF-07HHRA-005 - Truck	15:55	0:30	1,000	30	33	
16:30	Truck - EMF-07HHRA-006	16:50	0:20	300	20	15	
16:55	EMF-07HHRA-006 - Truck	17:15	0:20	300	20	15	
9:15	Truck - NMF-07HHRA-001	10:45	1:30	900	90	10	4
10:50	NMF-07HHRA-001 - NMF-07HHRA-003	11:25	0:35	750	35	21	
11:30	NMF-07HHRA-003 - NMF-07HHRA-005	12:15	0:45	790	45	18	
12:20	NMF-07HHRA-005 - Truck	13:20	1:00	1,350	60	23	
13:45	Truck - NMF-07HHRA-002	14:15	0:30	350	30	12	
14:40	NMF-07HHRA-002 - NMF-07HHRA-004	15:50	1:10	825	70	12	
15:55	NMF-07HHRA-004 - Truck	17:00	1:05	1,175	65	18	
9:35	Truck - SKW-07HHRA-002	9:50	0:15	625	15	42	5
10:10	SKW-07HHRA-002 - SKW-07HHRA-001	10:30	0:20	440	20	22	
10:35	SKW-07HHRA-001 - Truck	10:45	0:10	600	10	60	
11:00	Truck - SKW-07HHRA-003	11:00	0:00*	25	0	0	
11:20	Truck - SKW-07HHRA-004	11:20	0:00*	40	0	0	
11:40	Truck - SKW-07HHRA-005	11:40	0:00*	40	0	0	
12:00	Truck - SKW-07HHRA-006	12:00	0:00*	25	0	0	
	Average per Segment		**0:39**	**924**	**39**	**32**	

Note:

*Denotes a sample easily collected near the truck. Hiking time was negligible.

Table 3-1: B&C 10-Series Soil Sample Analytical Results for Arsenic and Copper (<250 µm Fraction)

Samples	Arsenic (As) (mg/Kg)	As Q	Copper (Cu) (mg/Kg)	Cu Q	Easting	Northing
Non-residential SRL	10		41,000			
GPL	290		NA			
East Mountain Front						
10-154	31	---	780	---	951,377.00	839,643.70
10-165	130	---	1,500	---	951,377.00	838,843.70
10-181	150	---	1,800	---	951,377.00	838,043.70
10-205	93	---	2,100	---	951,377.00	837,243.70
10-226	22	---	1,300	---	951,377.00	836,443.70
Industrial Area						
10-113	100	---	1,400	---	944,977.00	842,043.70
10-114	68	---	790	---	945,777.00	842,043.70
10-115	120	---	610	---	946,577.00	842,043.70
10-116	160	---	650	---	947,377.00	842,043.70
10-123	120	---	1,100	---	944,134.78	840,873.53
10-124	88	---	920	---	944,925.43	840,838.49
10-125	76	---	820	---	945,777.00	841,243.70
10-126	1.8	---	230	---	946,577.00	841,243.70
10-127	4.1	---	84	---	947,377.00	841,243.70
10-134	190	---	1,900	---	944,177.00	840,443.70
10-135	9.5	---	100	---	944,977.00	840,443.70
10-136	150	---	1,300	---	945,777.00	840,443.70
10-138	20	---	75	---	947,377.00	840,443.70
10-144	88	---	1,100	---	943,900.00	840,000.00
10-145	200	---	1,800	---	944,177.00	839,643.70
10-146	150	---	1,900	---	944,977.00	839,643.70
10-147	330	---	3,000	---	945,777.00	839,643.70
10-149	29	---	310	---	947,377.00	839,643.70
10-155	340	---	1,900	---	944,031.30	838,826.70
10-156	81	---	960	---	944,177.00	838,843.70
10-157	380	---	4,900	---	944,977.00	838,843.70
10-158	9.8	---	200	---	945,777.00	838,843.70
10-161	49	---	510	---	948,177.00	838,843.70
10-163	220	---	4,300	---	949,777.00	838,843.70
10-164	78	---	1,300	---	950,577.00	838,843.70
10-166	51	---	500	---	943,610.92	838,043.70
10-167	490	---	4,200	---	944,177.00	838,043.70
10-179	250	---	5,200	---	949,977.00	837,843.70
10-180	56	---	10,000	---	950,577.00	838,043.70
10-182	330	---	4,000	---	943,610.92	837,243.70
10-183	120	---	1,900	---	943,977.00	837,443.70
10-184	20	---	330	---	943,977.00	837,043.70
10-185	22	---	360	---	944,377.00	837,443.70
10-186	8.6	---	290	---	944,377.00	837,043.70
10-187	320	---	3,000	---	944,777.00	837,443.70
10-188	1,000	---	10,000	---	944,777.00	837,043.70
10-189	28	---	360	---	945,177.00	837,443.70
10-190	12	---	770	---	945,577.00	837,443.70
10-191	930	---	11,000	---	945,577.00	837,043.70
10-192	810	---	19,000	---	946,377.00	837,043.70
10-193	40	---	700	---	946,777.00	837,443.70
10-194	46	---	1,000	---	946,777.00	837,043.70
10-195	360	---	2,000	---	947,177.00	837,443.70
10-196	770	---	20,000	---	947,177.00	837,043.70
10-197	31	---	790	---	947,577.00	837,043.70
10-204	13	---	3,100	---	949,577.00	837,443.70

Table 3-1: B&C 10-Series Soil Sample Analytical Results for Arsenic and Copper (<250 µm Fraction)

Samples	Arsenic (As) (mg/Kg)	As Q	Copper (Cu) (mg/Kg)	Cu Q	Easting	Northing
Non-residential SRL	**10**		**41,000**			
GPL	**290**		**NA**			
10-206	**1,100**	---	9,000	---	943,577.00	836,643.70
10-207	**70**	---	790	---	943,577.00	836,243.70
10-208	**13**	---	270	---	943,977.00	836,643.70
10-209	**600**	---	11,000	---	943,977.00	836,243.70
10-210	**18**	---	320	---	944,377.00	836,643.70
10-211	**1,400**	---	15,000	---	944,777.00	836,643.70
10-212	**1,700**	---	18,000	---	944,777.00	836,243.70
10-213	**1,300**	---	17,000	---	945,177.00	836,643.70
10-214	**2,400**	---	33,000	---	945,177.00	836,243.70
10-215	**2,300**	---	35,000	---	945,577.00	836,643.70
10-216	**2,800**	---	**68,000**	---	945,577.00	836,243.70
10-217	**1,800**	---	39,000	---	945,977.00	836,643.70
10-218	**3,500**	---	**140,000**	---	945,977.00	836,243.70
10-219	**1,000**	---	3,100	---	946,377.00	836,643.70
10-220	**150**	---	14,000	---	946,777.00	836,643.70
10-221	**72**	---	2,200	---	946,777.00	836,243.70
10-222	**2,500**	---	**52,000**	---	947,177.00	836,243.70
10-223	**67**	---	540	---	947,577.00	836,643.70
10-227	**72**	---	960	---	943,577.00	835,843.70
10-228	**910**	---	18,000	---	943,577.00	835,443.70
10-229	**2,200**	---	34,000	---	943,977.00	835,443.70
10-230	**1,500**	---	18,000	---	944,377.00	835,843.70
10-231	**1,000**	---	28,000	---	944,377.00	835,443.70
10-232	**1,400**	---	38,000	---	944,777.00	835,843.70
10-233	**4,500**	---	**93,000**	---	944,777.00	835,443.70
10-234	**4,500**	---	**110,000**	---	945,177.00	835,843.70
10-235	**3,500**	---	**55,000**	---	945,177.00	835,443.70
10-236	**2,500**	---	**110,000**	---	945,577.00	835,843.70
10-237	**5,100**	---	**220,000**	---	945,577.00	835,443.70
10-241	**4,000**	---	**140,000**	---	946,777.00	835,843.70
10-242	**460**	---	11,000	---	---	---
10-248	**660**	---	6,500	---	943,177.00	834,643.70
10-249	**960**	---	19,000	---	943,577.00	835,043.70
10-250	**240**	---	11,000	---	943,577.00	834,643.70
10-251	**470**	---	16,000	---	943,977.00	835,043.70
10-252	**280**	---	6,500	---	943,977.00	834,643.70
10-253	**1,400**	---	18,000	---	944,377.00	835,043.70
10-254	**840**	---	14,000	---	944,377.00	834,643.70
10-255	**2,200**	---	**43,000**	---	944,777.00	835,043.70
10-256	**350**	---	11,000	---	944,777.00	834,643.70
10-260	**290**	---	7,800	---	---	---
10-261	**210**	---	7,000	---	---	---
10-262	**44**	---	1,400	---	---	---
10-266	**420**	---	5,700	---	943,977.00	834,243.70
10-267	**420**	---	11,000	---	944,377.00	834,243.70
10-268	5.5	---	100	---	944,377.00	833,843.70
10-269	**730**	---	19,000	---	944,777.00	834,243.70
10-270	**25**	---	1,800	---	944,777.00	833,843.70
10-273	**60**	---	1,300	---	---	---
10-274	**170**	---	5,400	---	---	---
10-276	**95**	---	7,300	---	---	---
10-277	**30**	---	3,300	---	---	---
10-278	**57**	---	2,300	---	944,377.00	833,443.70

Table 3-1: B&C 10-Series Soil Sample Analytical Results for Arsenic and Copper (<250 µm Fraction)

Samples	Arsenic (As) (mg/Kg)	As Q	Copper (Cu) (mg/Kg)	Cu Q	Easting	Northing
Non-residential SRL	10		41,000			
GPL	290		NA			
10-279	12	---	160	---	944,377.00	833,043.70
10-282	11	---	370	---	945,177.00	833,043.70
10-283	84	---	3,100	---	---	---
10-284	33	---	1,200	---	---	---
10-285	46	---	1,700	---	---	---
10-286	36	---	3,000	---	---	---
North Mountain Front						
10-109	150	---	1,800	---	951,112.97	842,814.60
10-110	79	---	780	---	951,145.73	842,795.61
10-117	80	---	660	---	948,177.00	842,043.70
10-118	120	---	400	---	948,977.00	842,043.70
10-119	130	---	1,600	---	949,900.00	842,000.00
10-120	120	---	920	---	950,577.00	842,043.70
10-128	200	---	1,500	---	948,177.00	841,243.70
10-129	110	---	590	---	948,977.00	841,243.70
10-130	260	---	3,100	---	949,777.00	841,243.70
10-131	70	---	800	---	950,577.00	841,243.70
10-139	18	---	120	---	948,177.00	840,443.70
10-140	280	---	3,700	---	948,977.00	840,443.70
10-141	300	---	3,400	---	949,777.00	840,443.70
10-142	140	---	2,100	---	950,577.00	840,443.70
10-143	100	---	1,100	---	951,377.00	840,443.70
10-150	6.2	---	540	---	948,177.00	839,643.70
10-151	360	---	3,600	---	948,977.00	839,643.70
10-152	150	---	2,900	---	949,777.00	839,643.70
10-153	280	---	4,400	---	950,577.00	839,643.70
10-162	190	---	2,200	---	948,977.00	838,843.70
Silver King Wash						
10-100	80	---	1,000	---	943,406.27	842,796.47
10-111	79	---	880	---	943,900.00	842,000.00
10-112	110	---	1,000	---	944,095.83	842,000.00
10-122	39	---	580	---	943,420.86	841,239.30
10-133	82	---	550	---	943,431.00	840,156.59
Results Summary						
Number of Sample Results	135		135		NA	NA
Number Exceeding Non-Residential SRLs	128		10		NA	NA
Number Exceeding Non-Residential SRLs Outside Stack Zone	66		0		NA	NA
Number Exceeding GPLs	48		NA		NA	NA

Notes:
Source: B&C (1998)
mg/Kg = milligrams per kilogram
NA = not available
GPL = groundwater protection level
SRL = soil remediation level
Q = Qualifiers
Stippled cells indicate an exceedance of the non-residential SRL.
Blue cells indicate an exceedance of the GPL.
Green cells indicate sample located within the Stack Zone (arsenic concentrations > 500 mg/Kg).
All samples collected at surface level (0 to 1 inches below ground surface).

Table 3-2: 10-Series Soil Sample Analytical Results for Additional Constituents (<250 µm Fraction)

Sample ID	Sample Location	Depth of Top of Sample (ft bgs)	Depth of Bottom of Sample (ft bgs)	Average Depth (ft bgs)	Antimony (mg/Kg)	Sb Q	Arsenic (mg/Kg)	As Q	Barium (mg/Kg)	Ba Q	Beryllium (mg/Kg)	Be Q	Cadmium (mg/Kg)	Cd Q	Chromium (mg/Kg)	Cr Q	Copper (mg/Kg)	Cu Q	Lead (mg/Kg)	Pb Q	Mercury (mg/Kg)	Hg Q	Nickel (mg/Kg)	Ni Q	Selenium (mg/Kg)	Se Q	Silver (mg/Kg)	Ag Q	Thallium (mg/Kg)	Tl Q	Zinc (mg/Kg)	Zn Q
Non-residential SRL (mg/kg)					410		10		170,000		1,900		510		65		41,000		800		310		20,000		5,100		5,100		67		310,000	
GPL(mg/kg)					**35**		**290**		12,000		23		**29**		590		NA		**290**		12		590		290		NA		**12**		NA	
Industrial Area																																
10-167-JDSL	10-167	0	0.8	0.4	---	---	**490**	---	---	---	---	---	---	---	---	---	4,200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-167-JDSL	10-167	0	0.8	0.4	6.6	---	**570**	---	84	---	5.0	U	5.9	---	11	---	4,300	---	280	---	0.8	---	10	---	10	U	9.4	---	5.0	U	470	---
10-172-BDSL	10-172	0	0.8	0.4	---	---	**94**	---	---	---	---	---	---	---	---	---	**68,000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-172-JDSL	10-172	0	0.8	0.4	---	---	**86**	---	---	---	---	---	---	---	---	---	**68,000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-172-JDSL	10-172	0	0.8	0.4	5.0	U	**100**	---	48	---	10	U	25	---	40	U	**59,000**	---	**330**	---	0.1	---	51	---	50	U	50	U	**100**	---	1,200	---
10-182-JDSL	10-182	0	0.8	0.4	---	---	**330**	---	---	---	---	---	---	---	---	---	4000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-211-JDSL	10-211	0	0.8	0.4	---	---	**1400**	---	---	---	---	---	---	---	---	---	15000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-219-JDSL	10-219	0	0.8	0.4	---	---	**1000**	---	---	---	---	---	---	---	---	---	3100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-219-JDSL	10-219	0	0.8	0.4	12	---	**970**	---	150	---	10	U	21	---	40	U	28000	---	**500**	---	1.8	---	61	---	34	---	50	U	100	U*	1,100	---
10-229-JDSL	10-229	0	0.8	0.4	---	---	**2200**	---	---	---	---	---	---	---	---	---	34000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-229-JDSL	10-229	0	0.8	0.4	31	---	**2,300**	---	140	---	10	U	**29**	---	52	---	39,000	---	**990**	---	3.4	---	72	---	45	---	55	---	100	U*	1,800	---
10-234-JDSL	10-234	0	0.8	0.4	---	---	**4500**	---	---	---	---	---	---	---	---	---	**110,000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-241-JDSL	10-241	0	0.8	0.4	---	---	**4000**	---	---	---	---	---	---	---	---	---	**140,000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-275-JDSL	10-275	0	0.8	0.4	---	---	**440**	---	---	---	---	---	---	---	---	---	4,500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-182-AESL	10-182	0	10	5	---	---	**230**	---	---	---	---	---	---	---	---	---	2,500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-182-AESL	10-182	0	10	5	5.0	U	**250**	---	140	---	5.0	U	3.8	---	33	---	2,700	---	110	---	0.4	---	22	---	10	U	4.6	---	5.0	U	260	---
10-234-AESL	10-234	0.8	8	4.4	---	---	**41**	---	---	---	---	---	---	---	---	---	680	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-234-AESL	10-234	0.8	8	4.4	5.0	U	**70**	---	95	---	5.0	U	1.5	---	15	---	810	---	29	---	0.2	---	20	---	10	U	2.5	U	5.0	U	98	---
10-211-AESL	10-211	0.8	10	5.4	---	---	**540**	---	---	---	---	---	---	---	---	---	6500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-241-AESL	10-241	0.8	10	5.4	---	---	**1600**	---	---	---	---	---	---	---	---	---	**67,000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-241-AESL	10-241	0.8	10	5.4	20	---	**1,400**	---	150	---	10	U	24	---	40	U	**45,000**	---	**470**	---	1.7	---	65	---	50	U	50	---	**100**	---	1,200	---
10-275-AESL	10-275	0.8	10	5.4	---	---	**85**	---	---	---	---	---	---	---	---	---	370	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-275-AESL	10-275	0.8	10	5.4	5.0	U	**130**	---	170	---	5.0	U	2.1	---	19	---	1,200	---	54	---	0.2	---	15	---	10	U	2.5	U	5.0	U	170	---
10-172-AESL	10-172	1	8	4.5	---	---	**86**	---	---	---	---	---	---	---	---	---	36,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-258-AESL	10-258	1	10	5.5	---	---	**2600**	---	---	---	---	---	---	---	---	---	**51,000**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-258-AESL	10-258	1	10	5.5	**39**	---	**2,400**	---	140	---	5.0	U	26	---	0.5	U	39,000	---	**840**	---	4.4	---	63	---	10	U	50	---	5.0	U	1,800	---
10-258-AFSL	10-258	10	14	12	---	---	**5400**	---	---	---	---	---	---	---	---	---	36,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-241-AFSL	10-241	10	15	12.5	---	---	**670**	---	---	---	---	---	---	---	---	---	16,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-182-AFSL	10-182	10	20	15	---	---	**31**	---	---	---	---	---	---	---	---	---	310	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-211-AFSL	10-211	10	24	17	---	---	**31**	---	---	---	---	---	---	---	---	---	120	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-211-AFSL	10-211	10	24	17	5.0	U	**73**	---	170	---	5.0	U	1.3	---	11	---	550	---	14	---	0.1	---	18	---	10	U	2.5	U	5.0	U	74	---
10-275-AFSL	10-275	10	24	17	---	---	**12**	---	---	---	---	---	---	---	---	---	94	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Summary																																
Number of Sample Results					10		32		10		10		10		10		32		10		10		10		10		10		10		10	
Number of Non-detects					5		0		0		10		0		4		0		0		0		0		8		5		8		0	
Percentage of Non-detects					50%		0%		0%		100%		0%		40%		0%		0%		0%		0%		80%		50%		80%		0%	
Number Exceeding Non-Residential SRLs					0		32		0		0		0		0		8		2		0		0		0		0		2		0	
Number Exceeding GPLs					1		18		0		0		1		0		0		5		0		0		0		0		2		0	

Notes:
<2.5 = Not detected, value presented is one-half the detection limit
FD = Field Duplicates
ft bgs = feet below ground surface
mg/Kg = milligrams per kilogram
NA = not available
GPL = Groundwater Protection Level
SRL = Soil Remediation Level
Q = Qualifiers
U = The analyte was analyzed for, but was not detected above the level of either the sample quantitation limit or the sample detection limit. Half the reporting limit was substituted for calculations.
*indicates a sample with a detection limit above at least one standard.
Stippled cells indicate an exceedance of the non-residential SRL.
Blue cells indicate an exceedance of the GPL.
Green = Sample also included in Table 3-1

Table 3-3: Summary of October 2001 Sampling Event

Sample[a]	Distance from Stack (feet)	Hillslope Position	Aspect	Location wrt to Stack	Angle from Stack (N=0o)	Sample Type	Layer Thickness[b] (inches)	Sample Depth[c] (inches)	Dry Color	Size Classification	HCl Reactivity
GAI-4S	450	Mid-Slope	Facing Stack	Downwind	332	Surface	1/2 to 1	---	Light Olive Gray	Silty Sand w/Gravel (SM)	No
GAI-4D						Underlying	---	1-1/2 to 3	Moderate Yellowish Brown	Silty Sand w/Gravel (SM)	No
GAI-3S	560	Toe	Facing Stack	Upwind	259	Surface	1/2 to 2	---	Light Olive Gray	Well-Graded Gravel (GW)	No
GAI-3D						Underlying	---	4 to 6	Moderate Yellowish Brown	Silty Sand w/Gravel (SM)	Yes
GAI-2S	810	Mid-Slope	Away from Stack	Upwind	274	Surface	1-1/2 to 3	---	Light Olive Gray	Silty Sand w/Gravel (SM)	No
GAI-2D						Underlying	---	3 to 5	Moderate Yellowish Brown	Clayey Sand w/Gravel (SC)	No
GAI-6S	1,050	Mid-Slope	Facing Stack	Crosswind	317	Surface	1/4 to 1/2	---	Light Olive Gray	Silty Sand w/Gravel (SM)	No
GAI-6D						Underlying	---	3 to 4	Moderate Yellowish Brown	Clayey Sand w/Gravel (SC)	No
GAI-7S	1,190	Crest	n/a	Crosswind	318	Surface	1/2 to 3/4	---	Light Olive Gray	Silty Sand w/Gravel (SM)	No
GAI-7D						Underlying	---	1-1/2 to 3	Moderate Yellowish Brown	Silty Sand w/Gravel (SM)	No
GAI-8S	1,380	Mid-Slope	Away from Stack	Crosswind	317	Surface	1/2	---	Light Olive Gray	Silty Sand w/Gravel (SM)	No
GAI-8D						Underlying	---	2 to 3	Moderate Yellowish Brown	Clayey Sand w/Gravel (SC)	No
GAI-5S	1,650	Mid-Slope	Facing Stack	Downwind	13	Surface	1/2	---	Light Olive Gray	Silty Sand w/Gravel (SM)	No
GAI-5D						Underlying	---	1-1/2 to 3	Moderate Yellowish Brown	Silty Sand w/Gravel (SM)	No
GAI-1S	2,030	Crest	n/a	Upwind	236	Surface	1/4 to 1/8	---	Light Olive Gray	Silty Sand w/Gravel (SM)	Yes
GAI-1D						Underlying	---	1-1/2 to 3	Pale Brown	Silty Sand w/Gravel (SM)	Yes
GAI-9S	2,040	Crest	n/a	Crosswind	316	Surface	1/4 to 1/2	---	Light Olive Gray	Silty Sand w/Gravel (SM)	No
GAI-9D						Underlying	---	1-1/2 to 3	Moderate Yellowish Brown	Silty Sand w/Gravel (SM)	No

Notes:

[a] Samples arranged by distance from stack.

[b] Thickness of suface layer with variable thickness and irregular contact with underlying layer. Sample taken from entire thickness of surface layer.

[c] Sample depth from well below surface layer to prevent possible mixing of the layers.

n/a = Not applicable

wrt = With respect to

HCl = Hydrochloric acid

Table 3-4: Golder 2001 Sample Analytical Results for Gray Layer Soil Samples (<250 µm Fraction)

	Aluminum (Al) (mg/Kg)	Al Q	Antimony (Sb) (mg/Kg)	Sb Q	Arsenic (As) (mg/Kg)	As Q	Barium (Ba) (mg/Kg)	Ba Q	Beryllium (Be) (mg/Kg)	Be Q	Boron (B) (mg/Kg)	B Q	Cadmium (Cd) (mg/Kg)	Cd Q	Chromium (Cr) (mg/Kg)	Cr Q	Cobalt (Co) (mg/Kg)	Co Q	Copper (Cu) (mg/Kg)	Cu Q	Iron (Fe) (mg/Kg)	Fe Q	Lead (Pb) (mg/Kg)	Pb Q
Regulatory Limits																								
Non-Residential SRL	920,000		410		10		170,000		1,900		200,000		510		65		13,000		41,000		---		800	
Minimum GPL	---		35		290		12,000		23		---		29		590		---		---		---		290	
Industrial Area																								
GAI-1S	11,400	---	12.0	J	661	---	120	---	1.0	U	20	U	9.3	---	31.9	---	17.8	---	22,100	---	50,600	---	525	---
GAI-2S	6,950	---	68.3	J	4,350	---	69.7	---	1.0	U	20	U	15.2	---	10.4	---	27.5	---	199,000	---	86,100	---	1,550	---
GAI-3S	6,820	---	106.0	J	6,990	---	86.0	---	1.0	U	20	U	17.6	---	11.4	---	35.9	---	259,000	---	107,000	---	2,070	---
GAI-4S	9,060	---	54.7	J	4,360	---	89.7	---	1.0	U	20	U	12.3	---	27.3	---	23.9	---	176,000	---	83,400	---	1,290	---
GAI-5S	11,700	---	6.1	J	448	---	83.3	---	1.0	U	20	U	4.8	---	12.8	---	11.1	---	6,590	---	81,100	---	207	---
GAI-6S	9,370	---	34.7	J	2,410	---	92.2	---	1.0	U	20	U	12.5	---	13.2	---	18.2	---	72,000	---	78,700	---	1,050	---
GAI-7S	9,310	---	43.1	J	3,050	---	91.5	---	1.0	U	20	U	14.6	---	13.6	---	21.8	---	99,600	---	84,100	---	1,280	---
GAI-8S	11,100	---	20.3	J	1,440	---	113	---	1.0	U	20	U	10.0	---	12.7	---	13.9	---	33,700	---	58,200	---	683	---
GAI-9S	13,200	---	12.6	J	834	---	98.0	---	1.0	U	20	U	7.3	---	18.6	---	13.7	---	17,200	---	71,400	---	388	---
GAI-11S	9,400	---	54.6	J	4,190	---	99.2	---	1.0	U	20	U	16.8	---	11.6	---	22.4	---	98,300	---	79,400	---	1,520	---
Summary Statistics																								
Count	10		10		10		10		10		10		10		10		10		10		10		10	
Non-Detect Count	0		0		0		0		10		10		0		0		0		0		0		0	
Non-Detect %	0%		0%		0%		0%		100%		100%		0%		0%		0%		0%		0%		0%	
Minimum	6,820		6.1		448		69.7		1.0		20		4.8		10.4		11.1		6,590		50,600		207	
Maximum	13,200		106		6,990		120		1.0		20		17.6		31.9		35.9		259,000		107,000		2,070	
Mean	9,831		41.2		2,867		94.3		1.0		20		12.0		16.4		20.6		98,349		78,000		1,056	
Median	9,385		38.9		2,730		91.85		1.0		20		12.4		13		20		85,150		80,250		1,165	
Standard Deviation	2,042		31.1		2,112		14.4		0		0		4.2		7.4		7.4		86,707		15,533		594	
Coefficient of Variation	0.2		0.8		0.7		0.2		0		0		0.3		0.5		0.4		0.9		0.2		0.6	
Number of Exceedances																								
Non-Residential SRL	0		0		10		0		0		0		0		0		0		6		---		6	
Minimum GPL	---		5		10		0		0		---		0		0		---		---		---		9	

Notes: mg/Kg = milligrams per kilogram
--- = No GPL, SRL, or qualifier
Q = Qualifiers

U = The analyte was analyzed for, but was not detected above the level of either the sample quantitation limit or the sample detection limit.
Half the reporting limit was substituted for calculations.
J = The associated value is an estimated quantity
GPL = Groundwater Protection Level
SRL = Soil Remediation Level
Stippled cells indicate an exceedance of the non-residential SRL.
Blue cells indicate an exceedance of the GPL.
Samples collected in range of 0-1 inches below ground surface.
Sample GAI-11S is a field duplicate of GAI-7S.

Golder Associates

Table 3-4: Golder 2001 Sample Analytical Results for Gray Layer Soil Samples (<250 µm Fraction)

	Manganese (Mn) (mg/Kg)	Mn Q	Mercury (Hg) (mg/Kg)	Hg Q	Molybdenum (Mo) (mg/Kg)	Mo Q	Nickel (Ni) (mg/Kg)	Ni Q	Selenium (Se) (mg/Kg)	Se Q	Silver (Ag) (mg/Kg)	Ag Q	Strontium (Sr) (mg/Kg)	Sr Q	Thallium (Tl) (mg/Kg)	Tl Q	Tin (Sn) (mg/Kg)	Sn Q	Vanadium (V) (mg/Kg)	V Q	Zinc (Zn) (mg/Kg)	Zn Q
Regulatory Limits																						
Non-Residential SRL	32,000		310		5,100		20,000		5,100		5,100		610,000		67		610,000		1,000		310,000	
Minimum GPL	---		12		---		590		290		---		---		12		---		---		---	
Industrial Area																						
GAI-1S	671	---	1.09	J	4.0	U	21.0	---	5	U	29.1	---	66.7	J	5	U	16.0	---	93.0	---	1,230	---
GAI-2S	600	---	6.51	J	4.0	U	33.0	---	5	U	112	---	31.4	J	5	U	58.0	---	25.8	---	4,340	---
GAI-3S	660	---	10.8	J	4.0	U	34.0	---	13.0	---	135	---	30.4	J	5	U	71.0	---	24.8	---	4,670	---
GAI-4S	726	---	4.99	J	4.0	U	22.0	---	11.0	---	125	---	40.8	J	5	U	53.0	---	36.6	---	4,060	---
GAI-5S	465	---	0.542	J	4.0	U	5.0	U	5	U	14.4	---	58.2	J	5	U	5.0	U	58.0	---	563	---
GAI-6S	749	---	4.6	J	4.0	U	21.0	---	5	U	88.8	---	36.7	J	5	U	45.0	---	48.3	---	2,390	---
GAI-7S	768	---	5.71	J	4.0	U	24.0	---	5	U	123	---	42.6	J	5	U	32.0	---	52.2	---	2,870	---
GAI-8S	609	---	2.52	J	4.0	U	14.0	---	5	U	49.9	---	50.4	J	5	U	18.0	---	48.3	---	1,480	---
GAI-9S	530	---	1.36	J	4.0	U	5.0	U	5	U	27.4	---	68.4	J	5	U	11.0	---	59.5	---	1,030	---
GAI-11S	884	---	7.82	J	4.0	U	28.0	---	5	U	10.0	---	43.5	J	5	U	35.0	---	43.3	---	2,960	---
Summary Statistics																						
Count	10		10		10		10		10		10		10		10		10		10		10	
Non-Detect Count	0		0		10		2		8		0		0		10		1		0		0	
Non-Detect %	0%		0%		100%		20%		80%		0%		0%		100%		10%		0%		0%	
Minimum	465		0.542		4.0		5.0		5.0		10.0		30.4		5		5.0		24.8		563	
Maximum	884		10.8		4.0		34.0		13.0		135		68.4		5		71.0		93.0		4,670	
Mean	666		4.6		4.0		20.7		6.4		71.5		46.9		5		34.4		49.0		2,559	
Median	665.5		4.80		4.0		21.5		5.0		69.35		43.05		5		33.5		48.3		2,630	
Standard Deviation	122		3.29		0		10.2		3.0		50.3		13.7		0		22.1		19.6		1,469	
Coefficient of Variation	0.2		0.72		0		0.5		0.5		0.7		0.3		0		0.6		0.4		0.6	
Number of Exceedances																						
Non-Residential SRL	0		0		0		0		0		0		0		0		0		0		0	
Minimum GPL	---		0		---		0		0		---		---		0		---		---		---	

Notes: mg/Kg = milligrams per kilogram
--- = No GPL, SRL, or qualifier
Q = Qualifiers

U = The analyte was analyzed for, but was not detected above the level of either the sample quantitation limit or the sample detection limit. Half the reporting limit was substituted for calculations.
J = The associated value is an estimated quantity
GPL = Groundwater Protection Level
SRL = Soil Remediation Level
Stippled cells indicate an exceedance of the non-residential SRL.
Blue cells indicate an exceedance of the GPL.
Samples collected in range of 0-1 inches below ground surface.
Sample GAI-11S is a field duplicate of GAI-7S.

Table 3-5: Golder 2001 Sample Analytical Results for Underlying Layer Soil Samples (<250 µm Fraction)

	Aluminum (Al) (mg/Kg)	Al Q	Antimony (Sb) (mg/Kg)	Sb Q	Arsenic (As) (mg/Kg)	As Q	Barium (Ba) (mg/Kg)	Ba Q	Beryllium (Be) (mg/Kg)	Be Q	Boron (B) (mg/Kg)	B Q	Cadmium (Cd) (mg/Kg)	Cd Q	Chromium (Cr) (mg/Kg)	Cr Q	Cobalt (Co) (mg/Kg)	Co Q	Copper (Cu) (mg/Kg)	Cu Q	Iron (Fe) (mg/Kg)	Fe Q	Lead (Pb) (mg/Kg)	Pb Q
Regulatory Limits																								
Non-Residential SRL	920,000		410		10		170,000		1,900		200,000		510		65		13,000		41,000		---		800	
Minimum GPL	---		35		290		12,000		23		---		29		590		---		---		---		290	
Industrial Area																								
GAI-1D	15,400	---	2.3	J	66.7	---	115	---	0.5	---	2.0	U	1.8	---	27.3	---	13.6	---	1,280	---	29,500	---	44.0	---
GAI-2D	22,700	---	2.6	J	351	---	151	---	0.9	---	2.0	U	4.9	---	19.2	---	11.9	---	4,630	---	29,500	---	34.8	---
GAI-3D	20,000	---	2.6	J	296	---	127	---	0.8	---	2.0	U	5.5	---	20.1	---	13.6	---	5,230	---	30,400	---	47.6	---
GAI-4D	19,900	---	2.3	J	271	---	155	---	0.8	---	2.0	U	3.5	---	14.0	---	12.0	---	4,610	---	26,600	---	42.4	---
GAI-5D	22,000	---	0.8	J	82.1	---	186	---	0.8	---	2.0	U	2.7	---	13.0	---	13.9	---	1,660	---	29,500	---	15.6	---
GAI-6D	20,300	---	2.1	J	218	---	131	---	0.8	---	2.0	U	3.0	---	16.6	---	11.9	---	3,120	---	31,100	---	35.5	---
GAI-7D	20,700	---	5.1	J	357	---	135	---	0.7	---	2.0	U	4.2	---	16.9	---	10.6	---	5,650	---	32,500	---	86.8	---
GAI-8D	16,500	---	2.5	UJ	246	---	133	---	1.0	U	20.0	U	3.6	---	16.7	---	13.1	---	3,390	---	31,200	---	76.5	---
GAI-9D	20,900	---	2.1	J	160	---	154	---	0.7	---	2.0	U	2.8	---	17.1	---	10.0	---	1,910	---	25,800	---	27.0	---
Summary Statistics																								
Count	9		9		9		9		9		9		9		9		9		9		9		9	
Non-Detect Count	0		1		0		0		1		9		0		0		0		0		0		0	
Non-Detect %	0%		11%		0%		0%		11%		100%		0%		0%		0%		0%		0%		0%	
Minimum	15,400		0.8		66.7		115		0.5		2.0		1.8		13		10.0		1,280		25,800		15.6	
Maximum	22,700		5.1		357		186		1.0		20.0		5.5		27.3		13.9		5,650		32,500		86.8	
Mean	19,822		2.5		228		143		0.8		4.0		3.6		17.9		12.3		3,498		29,567		45.6	
Median	20,300		2.3		246		135		0.8		2.0		3.5		16.9		12.0		3,390		29,500		42.4	
Standard Deviation	2,393		1.1		106		21		0.1		6.0		1.2		4.2		1.4		1,625		2,160		22.7	
Coefficient of Variation	0.1		0.5		0.5		0.1		0.2		1.5		0.3		0.2		0.1		0.5		0.1		0.5	
Number of Exceedances																								
Non-Residential SRL	0		0		9		0		0		0		0		0		0		0		---		0	
Minimum GPL	---		0		3		0		0		---		0		0		---		---		---		0	

Notes: mg/Kg = milligrams per kilogram
--- = No GPL, SRL, or qualifier
Q = Qualifiers
U = The analyte was analyzed for, but was not detected above the level of either the sample quantitation limit or the sample detection limit. Half the reporting limit was substituted for calculations.
J = The associated value is an estimated quantity.
UJ = The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
GPL = Groundwater Protection Level
SRL = Soil Remediation Level
Stippled cells indicate an exceedance of the non-residential SRL.
Blue cells indicate an exceedance of the GPL.
Samples collected in range of 1.5-6 inches below ground surface.
The concentration and reporting limit for tin samples GAI-1D, -2D, -3D, -4D, -5D, -6D, -7D, and -9D were based on 5 times the preparation blank concentration of 1.5 mg/kg

Table 3-5: Golder 2001 Sample Analytical Results for Underlying Layer Soil Samples (<250 µm Fraction)

	Manganese (Mn) (mg/Kg)	Mn Q	Mercury (Hg) (mg/Kg)	Hg Q	Molybdenum (Mo) (mg/Kg)	Mo Q	Nickel (Ni) (mg/Kg)	Ni Q	Selenium (Se) (mg/Kg)	Se Q	Silver (Ag) (mg/Kg)	Ag Q	Strontium (Sr) (mg/Kg)	Sr Q	Thallium (Tl) (mg/Kg)	Tl Q	Tin (Sn) (mg/Kg)	Sn Q	Vanadium (V) (mg/Kg)	V Q	Zinc (Zn) (mg/Kg)	Zn Q
Regulatory Limits																						
Non-Residential SRL	32,000		310		5,100		20,000		5,100		5,100		610,000		67		610,000		1,000		310,000	
Minimum GPL	---		12		---		590		290		---		---		12		---		---		---	
Industrial Area																						
GAI-1D	408	---	0.27	J	1.5	---	16.9	---	0.5	U	3.3	---	137	J	0.5	U	3.75	U	77.8	---	113	---
GAI-2D	438	---	0.612	J	1.2	---	13.5	---	0.5	U	2.5	---	118	J	0.5	U	3.75	U	64.8	---	418	---
GAI-3D	552	---	0.316	J	1.3	---	16.6	---	0.5	U	5.2	---	116	J	0.5	U	3.75	U	68.9	---	561	---
GAI-4D	474	---	0.204	J	1.3	---	10.8	---	0.5	U	4.8	---	115	J	0.5	U	3.75	U	57.5	---	478	---
GAI-5D	559	---	0.081	J	1.3	---	7.2	---	0.5	U	1.7	---	136	J	0.5	U	3.75	U	63.1	---	156	---
GAI-6D	521	---	0.218	J	1.2	---	7.1	---	0.5	U	3.4	---	97.6	J	0.5	U	3.75	U	78.2	---	222	---
GAI-7D	317	---	0.448	J	1.3	---	8.9	---	0.5	U	6.1	---	107	J	0.5	U	3.75	U	76	---	350	---
GAI-8D	520	---	0.336	J	4.0	U	5.0	U	5.0	U	2.5	U	73.9	J	5.0	U	5.0	U	71.6	---	340	---
GAI-9D	236	---	0.069	J	1.2	---	10.3	---	0.5	U	1.7	---	134	J	0.5	U	3.75	U	57.2	---	204	---
Summary Statistics																						
Count	9		9		9		9		9		9		9		9		9		9		9	
Non-Detect Count	0		0		1		1		9		1		0		9		9		0		0	
Non-Detect %	0%		0%		11%		11%		100%		11%		0%		100%		100%		0%		0%	
Minimum	236		0.069		1.2		5		0.5		1.7		73.9		0.5		3.75		57.2		113	
Maximum	559		0.612		4.0		16.9		5.0		6.1		137		5.0		5.0		78.2		561	
Mean	447		0.284		1.6		10.7		1.0		3.5		115		1.0		3.89		68.3		316	
Median	474		0.270		1.3		10.3		0.5		3.3		116		0.5		3.75		68.9		340	
Standard Deviation	111		0.172		0.9		4.2		1.5		1.6		20		1.5		0.42		8.2		153	
Coefficient of Variation	0.2		0.6		0.6		0.4		1.5		0.5		0.2		1.5		0.1		0.1		0.5	
Number of Exceedances																						
Non-Residential SRL	0		0		0		0		0		0		0		0		0		0		0	
Minimum GPL	---		0		---		0		0		---		---		0		---		---		---	

Notes: mg/Kg = milligrams per kilogram
--- = No GPL, SRL, or qualifier
Q = Qualifiers
U = The analyte was analyzed for, but was not detected above the level of either the sample quantitation limit or the sample detection limit. Half the reporting limit was substituted for calculations.
J = The associated value is an estimated quantity.
UJ = The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
GPL = Groundwater Protection Level
SRL = Soil Remediation Level
Stippled cells indicate an exceedance of the non-residential SRL.
Blue cells indicate an exceedance of the GPL.
Samples collected in range of 1.5-6 inches below ground surface.
The concentration and reporting limit for tin samples GAI-1D, -2D, -3D, -4D, -5D, -6D, -7D, and -9D were based on 5 times the preparation blank concentration of 1.5 mg/kg

Table 3-6: February 2008 and February 2009 Soil Sample Analytical Results (<250 µm Fraction)

Sample	Arsenic (As) (mg/Kg)	As Q	Copper (Cu) (mg/Kg)	Cu Q	Lead (Pb) (mg/Kg)	Pb Q
Non-residential SRL	10		41,000		800	
GPL	**290**		NA		**290**	
EMF-07HHRA-001	39.1	---	215	---	94.5	---
EMF-07HHRA-002	283	---	4,100	---	**582**	---
EMF-07HHRA-003	123	---	1,990	---	**341**	---
EMF-07HHRA-004	258	---	4,450	---	**334**	---
EMF-07HHRA-005	387	---	4,800	---	1,780	---
EMF-07HHRA-006	149	---	3,090	---	224	---
EMF-07HHRA-002N1	158	---	3,150	---	236	---
EMF-07HHRA-002S1	225	---	3,960	---	**293**	---
EMF-07HHRA-003N1	162	---	2,060	---	**323**	---
EMF-07HHRA-003W1	272	---	3,420	---	**514**	---
EMF-07HHRA-004N1	211	---	3,210	---	226	---
EMF-07HHRA-004W1	251	---	3,780	---	**304**	---
EMF-07HHRA-005N1	210	---	969	---	155	---
EMF-07HHRA-005E1	291	---	3,820	---	**307**	---
BFD-2 (dup. of -001)	38.2	---	212	---	104	---
NMF-07HHRA-001	45.3	---	456	---	56.4	---
NMF-07HHRA-002	31.9	---	181	---	110	---
NMF-07HHRA-003	64.3	---	865	---	87.9	---
NMF-07HHRA-004	87.0	---	1,300	---	86.7	---
NMF-07HHRA-005	176	---	1,750	---	818	---
NMF-07HHRA-006	51.3	---	448	---	64.9	---
NMF-07HHRA-007	53.1	---	821	---	85.3	---
NMF-07HHRA-008	37.6	---	380	---	64.3	---
NMF-07HHRA-009	94.3	---	1,200	---	191	---
NMF-07HHRA-010	35.9	---	799	---	95.3	---
NMF-07HHRA-011	32.4	---	180	---	191	---
NMF-07HHRA-012	87.1	---	887	---	119	---
NMF-07HHRA-013	44.0	---	240	---	161	---
NMF-07HHRA-014	69.1	---	1,600	---	168	---
NMF-07HHRA-015	223	---	1,120	---	138	---
NMF-07HHRA-005E1	97	---	1,170	---	271	---
NMF-07HHRA-005S1	79	---	702	---	178	---
BFD-1 (dup. of -013)	41.2	---	219	---	156	---
BFD-3 (dup. of -003)	82.2	---	1,250	---	110	---
SKW-07HHRA-001	61.4	---	651	---	65.6	---
SKW-07HHRA-002	80.6	---	1,130	---	116	---
SKW-07HHRA-003	55.9	---	721	---	76.9	---
SKW-07HHRA-004	23.0	---	184	---	24.1	---
SKW-07HHRA-005	125	---	1,100	---	95.7	---
SKW-07HHRA-006	127	---	808	---	102	---
BFD-4 (dup. of -003)	53.5	---	677	---	75.0	---
Results Summary						
Number of Sample Results	41		41		41	
Number Exceeding Non-Residential SRLs	41		0		2	
Number Exceeding GPLs	2		NA		10	

Notes:

BFD = blind field duplicate	122.3	1,562.6	232.3
mg/Kg = milligrams per kilogram	23.0	180.0	24.1
GPL = Groundwater Protection Level	387.0	4,800.0	1,780.0

SRL = Soil Remediation Level
Q = Qualifiers
NA = Not available
Stippled cells indicate an exceedance of the non-residential SRL.
Blue cells indicate an exceedance of the GPL.
All samples collected at surface level (0 to 2 inches below ground surface).

Table 3-7: February 2009 Soil Sample Analytical Results for Field XRF, Laboratory Metals, and SPLP Metals (Bulk Samples)

Sample	2008 Laboratory Lead (mg/Kg) [1]	XRF Results				Laboratory Total Metals Results [1]			Laboratory SPLP Results		
		XRF Lead (mg/Kg)	XRF Lead Counting Error	Mean XRF Lead (mg/Kg)	RPD (XRF/ 2008 Laboratory)	Laboratory Total Arsenic (mg/Kg)	Laboratory Total Copper (mg/Kg)	Laboratory Total Lead (mg/Kg)	Arsenic SPLP (mg/L)	Copper SPLP (mg/L)	Lead SPLP (mg/L)
Non-residential SRL	800	800		800		10	41,000	800	---	---	---
GPL	290	290		290		290	NS	290	---	---	---
East Mountain Front											
EMF-07HHRA-002N1	582	337	15	316	53.3	158	3,150	236	0.096	0.326	0.032
		305	14		62.5						
		305	14		62.5						
EMF-07HHRA-002S1		388	17	387	40.0	225	3,960	293	0.120	0.310	0.023
		389	17		39.8						
		384	16		41.0						
EMF-07HHRA-002E1		94	8	108	144.3						
		107	9		137.9						
		122	10		130.7						
EMF-07HHRA-002W1		184	12	215	103.9						
		231	13		86.3						
		247	14		80.8						
		199	12		98.1						
EMF-07HHRA-003N1	341	472	17	533	32.2	162	2,060	323	0.162	0.349	0.056
		566	19		49.6						
		560	19		48.6						
EMF-07HHRA-003W1		597	19	655	54.6	272	3,420	514	0.218	0.515	0.086
		664	21		64.3						
		705	22		69.6						
EMF-07HHRA-004N1	334	435	17	417	26.3	211	3,210	226	0.149	0.292	0.028
		419	15		22.5						
		398	15		17.5						
EMF-07HHRA-004S1		107	9	97.4	102.8						
		83	8		120.4						
		102	9		106.4						
EMF-07HHRA-004E1		173	11	176	63.5						
		158	10		71.5						
		198	11		51.1						
EMF-07HHRA-004W1		466	17	451	33.0	251	3,780	304	0.160	0.402	0.031
		442	15.43		27.7						
		445	15.462		28.5						
EMF-07HHRA-005N1	1780	296	14	300	143.0	210	969	155	0.660	0.273	0.054
		310	14		140.7						
		294	13		143.3						
EMF-07HHRA-005S1		187	11	181	162.0	79.1	702	178			
		183	11		162.7						
		172	11		164.8						
EMF-07HHRA-005E1		512	19	459	110.6	291	3,820	307	0.087	0.591	0.083
		449	17		119.4						
		416	16		124.2						
EMF-07HHRA-005W1		245	13	199	151.6						
		169	11		165.3						
		182	11		162.9						
North Mountain Front											
NMF-07HHRA-005N1	818	173	10	178	130.2						
		184	11		126.5						
		176	10		129.2						
NMF-07HHRA-005S1		189	11	200	124.9	79.1	702	178	0.039	0.064	0.025
		200	11		121.4						
		212	11		117.7						
NMF-07HHRA-005E1		342	14	340	82.1	97.4	1,170	271	0.065	0.124	0.033
		334	14		84.0						
		343	15		81.8						

Notes:

[1] Data in these columns are also presented in Table 3-6.

mg/Kg = milligrams per kilogram

mg/L = milligrams per liter

GPL = Groundwater Protection Level

SRL = Soil Remediation Level

RPD = relative percent difference, where RPD = (ABS[**XRF** value-**laboratory** value])/([**XRF** value+**laboratory** value]/2) * 100

SPLP = Synthetic Precipitation Leaching Procedure

Stippled cells indicate an exceedance of the non-residential SRL.

Blue cells indicate an exceedance of the GPL.

Table 3-8: April 2008 Test Pit Soil Sample Analytical Results for Total Metals (<250 µm Fraction)

Sample ID	Depth Interval (units bgs)	Arsenic (As) (mg/Kg)	As Q	Copper (Cu) (mg/Kg)	Cu Q	Lead (Pb) (mg/Kg)	Pb Q
Non-residential SRL		10		41000		800	
GPL		290		NS		290	
Industrial Area							
RAWTP-01	0-2"	138	---	3,010	---	134	---
	2"-1'	44.7	---	456	---	21.5	---
	1'-2'	40.6	---	820	---	31.2	---
RAWTP-02	0-2"	166	---	9,050	---	192	---
	2"-1'	23.1	---	199	---	13.3	---
	1'-2'	24.3	---	46	---	9.3	---
	2'-3'	15	---	32	---	7.9	---
	3'-4'	19.7	---	32	---	7.9	---
RAWTP-03	0-2"	2,110	---	40,900	---	918	---
	2"-1'	313	J	5,960	J	147	J
	1'-2'	14.9	---	270	---	11.9	---
	2'-3'	34.5	---	830	---	19.9	---
	3'-4'	7.1	---	79	---	10.1	---
RAWTP-04	0-2"	2,090	---	90,600	---	920	---
	2"-1'	626	---	29,400	---	279	---
	1'-2'	400	---	18,700	---	169	---
	2'-3'	55.8	---	1,330	---	18.7	---
RAWTP-05	0-2"	66.9	---	1,540	---	63.2	---
	2"-1'	37.2	---	378	---	17	---
	1'-2'	23.9	---	149	---	10.4	---
RAWTP-06	0-2"	899	---	35,000	---	620	---
	2"-1'	521	---	18,600	---	322	---
	1'-2'	108	---	992	---	29.2	---
	2'-3'	52.4	---	334	---	9.7	---
	3'-4'	20.7	---	48	---	7	---
RAWTP-07	0-2"	59	---	2,730	---	69.9	---
	2"-1'	32.2	---	984	J+	26.1	---
	1'-2'	27.5	---	32	---	7.9	---
	2'-3'	11.3	---	57	J	7.4	---
RAWTP-08	0-2"	117	---	5,850	---	95.1	---
	2"-1'	49.9	---	111	---	10.4	---
	1'-2'	56.8	---	57	---	7	---
	2'-3'	8.7	---	25	---	4.8	---
	3'-4'	0.9	---	68	---	6.9	---
RAWTP-09	0-2"	1,430	---	32,600	---	715	---
	2"-1'	938	---	17,200	---	442	---
	1'-2'	23	---	518	---	18.6	---
	2'-3'	54	---	1,500	---	30.8	---
	3'-4'	8	---	198	---	9.2	---
RAWTP-10	0-2"	1,340	---	33,000	---	481	---
	2"-1'	1,450	---	29,200	---	455	---
	1'-2'	63	---	1,100	---	26.6	---
	2'-3'	458	---	8,390	---	458	---

Table 3-8: April 2008 Test Pit Soil Sample Analytical Results for Total Metals (<250 µm Fraction)

Sample ID	Depth Interval (units bgs)	Arsenic (As) (mg/Kg)	As Q	Copper (Cu) (mg/Kg)	Cu Q	Lead (Pb) (mg/Kg)	Pb Q
Non-residential SRL		10		41000		800	
GPL		290		NS		290	
RAWTP-11	0-2"	2,100	---	47,700	---	808	---
	2"-1'	62.5	---	1,650	---	34	---
	1'-2'	28.9	---	773	---	17.8	---
	2'-3'	29.2	---	705	---	20.5	---
RAWTP-12	0-2"	1,600	---	29,700	---	745	---
	2"-1'	1,110	---	10,700	---	389	---
	1'-2'	20	---	227	---	12.1	---
	2'-3'	22	J	247	J	14.1	---
	3'-4'	61	---	828	---	27.8	---
RAWTP-13	0-2"	92.9	---	954	---	72.1	---
	2"-1'	24.2	---	284	---	27.3	---
	1'-2'	11	---	83	---	35.6	---
	2'-3'	8.4	---	52	---	36.8	---
	3'-4'	9.3	---	61	---	38.7	---
RAWTP-14	0-2"	484	---	15400	---	284	---
	2"-1'	2,090	---	10,700	---	912	---
	1'-2'	429	---	4,320	---	142	---
	2'-3'	178	---	1,490	---	78	---
RAWTP-15	0-2"	713	---	1,640	---	291	---
	2"-1'	584	---	2,920	---	230	---
	1'-2'	297	---	1,960	---	113	---
	2'-3'	59.7	J	404	J	30.3	J
RAWTP-16	0-2"	331	J+	6,870	---	170	---
	2"-1'	127	---	2,030	---	43.3	---
	1'-2'	18	---	254	---	12.3	---
	2'-3'	6.6	---	122	---	11.2	---
	3'-4'	5.4	---	54	---	9.5	---
RAWTP-17	0-2"	2,590	---	100,000	---	1,050	---
	2"-1'	2,900	---	48,800	---	822	---
	1'-2'	958	---	10,100	---	221	---
	2'-3'	1,250	---	26,600	---	348	---
RAWTP-18	0-2"	1,390	---	31,900	---	582	---
	2"-1'	638	---	13,700	---	262	---
	1'-2'	111	---	2,640	---	49	---
	2'-3'	19.9	---	312	---	15.5	---
	3'-4'	76	---	1,710	---	37.6	---
RAWTP-19	0-2"	28.6	---	763	---	32.6	---
	2"-6"	17.1	---	341	---	21.5	---
RAWTP-20	0-2"	730	---	4,500	---	375	---
	2"-1'	188	---	910	---	61.4	---
	1'-2'	39	---	227	---	25.8	---
	2'-3'	5.6	---	63	---	5.8	---
	3'-4'	12.4	---	88	---	15.8	---
RAWTP-21	0-2"	200	---	2,560	---	153	---
	2"-1'	72.9	---	517	---	36.8	---
	1'-2'	30.9	---	262	---	23.6	---
	2'-3'	44	---	381	---	35.8	---

Table 3-8: April 2008 Test Pit Soil Sample Analytical Results for Total Metals (<250 µm Fraction)

Sample ID	Depth Interval (units bgs)	Arsenic (As) (mg/Kg)	As Q	Copper (Cu) (mg/Kg)	Cu Q	Lead (Pb) (mg/Kg)	Pb Q
Non-residential SRL		10		41000		800	
GPL		290		NS		290	
RAWTP-22	0-2"	1,480	---	37,400	---	715	---
	2"-1'	755	---	17,300	---	326	---
	2'-3'	76.3	---	478	---	20.4	---
	3'-4'	36.2	---	349	---	18.1	---
RAWTP-23	0-2"	194	---	889	---	118	---
	2"-1'	141	---	1,420	---	51.8	---
	1'-2'	34.1	---	297	---	21.2	---
RAWTP-24	0-2"	326	---	3,150	---	203	---
	2"-1'	120	---	1,200	---	60.4	---
	1'-2'	19	---	115	---	15.4	---
	2'-3'	8.5	---	62	---	18	---
	3'-4'	8.1	---	65	---	16.2	---
RAWTP-25	0-2"	204	---	2,100	---	169	---
	2"-1'	125	---	792	---	52.9	---
	1'-2'	14.9	J	116	J	18.4	---
	2'-3'	10.5	---	93	---	17.8	---
RAWTP-26	0-2"	102	---	1,180	---	104	---
	2"-1'	75	---	656	---	71.5	---
	1'-2'	19.7	---	95	---	18.5	---
RAWTP-27	0-2"	461	---	12,000	---	330	---
	2"-1'	426	---	7,750	---	136	---
	1'-2'	131	---	1,200	---	47.4	---
RAWTP-28	0-2"	252	---	841	---	126	---
	2"-1'	109	---	915	---	43.7	---
	1'-2'	55.9	---	257	---	33.9	---
	2'-3'	42.9	---	419	---	22.1	---
RAWTP-29	0-2"	230	---	2,110	---	184	---
	2"-1'	139	---	1,150	---	65.7	---
	1'-2'	98.2	---	550	---	39.9	---
	2'-3'	9.7	---	50	---	15.6	---
RAWTP-30	0-2"	57.9	---	845	---	66.1	---
	2"-1'	53.9	---	887	---	60.3	---
	1'-2'	23	---	88	---	16.9	---

Notes:
bgs = below ground surface
mg/Kg = milligrams per kilogram
GPL = Groundwater Protection Level
SRL = Soil Remediation Level
Q = Qualifiers
J = Estimated value
J+ = Estimated value with high bias
The more conservative standard for arsenic is the GPL.
The more conservative standard for lead is the SRL.
Stippled cells indicate an exceedance of the non-residential SRL.
Blue cells indicate an exceedance of the GPL.

Table 3-9: April 2008 Test Pit Soil Sample Analytical Results for Total Metals (Bulk Samples)

Constituent	Antimony (Sb) (mg/Kg)	Sb Q	Arsenic (As) (mg/Kg)	As Q	Barium (Ba) (mg/Kg)	Ba Q	Beryllium (Be) (mg/Kg)	Be Q	Cadmium (Cd) (mg/Kg)	Cd Q	Chromium (Cr) (mg/Kg)	Cr Q	Copper (Cu) (mg/Kg)	Cu Q	Lead (Pb) (mg/Kg)	Pb Q	Mercury (Hg) (mg/Kg)	Hg Q	Nickel (Ni) (mg/Kg)	Ni Q	Selenium (Se) (mg/Kg)	Se Q	Thallium (Tl) (mg/Kg)	Tl Q
Residential SRL	31		***10***		15,000		150		39		30		***3,100***		***400***		23		1,600		390		5.2	
Non-residential SRL	410		***10***		170,000		1,900		510		65		***41,000***		800		310		20,000		5,100		67	
Minimum GPL	35		***290***		12,000		23		29		590		NS		***290***		12		590		290		12	
Industrial Area																								
RAWTP-03 2"-1'	2.3	J-	***98.5***	J-	90.6	J-	0.416	J-	0.53	J-	11.4	J-	2,190	J-	51.3	J-	0.43	J-	18.7	J-	4	UJ-	1.5	UJ-
RAWTP-24 0-2"	3.1	J-	***157***	J-	82.7	J-	0.456	J-	0.53	J-	9.83	J-	1,880	J-	110	J-	0.263	J-	10.1	J-	4	UJ-	1.5	UJ-
RAWTP-20 0-2"	4	J-	***144***	J-	78.8	J-	0.362	J-	0.3	J-	5.41	J-	2,210	J-	143	J-	0.775	J-	5.54	J-	4	UJ-	1.5	UJ-
RAWTP-09 2"-1	4.7	J-	***355***	J-	89.9	J-	0.48	J-	1.88	J-	23.1	J-	***6,410***	J-	161	J-	0.232	J-	25.2	J-	4	UJ-	1.5	UJ-
RAWTP-18 0-2"	8.4	J-	***567***	J-	117	J-	0.423	J-	1.83	J-	8.02	J-	***13,300***	J-	264	J-	0.573	J-	12.2	J-	4	UJ-	1.5	UJ-
RAWTP-12 0-2"	11.2	J-	***949***	J-	112	J-	0.415	J-	4.65	J-	20.8	J-	***18,800***	J-	***489***	J-	0.978	J-	26.2	J-	4	UJ-	1.5	UJ-
RAWTP-04 0-2"	16	J-	***1,070***	J-	124	J-	0.583	J-	5.78	J-	11.4	J-	***50,100***	J-	***448***	J-	2.92	J-	20.6	J-	4	UJ-	1.5	UJ-
RAWTP-17 2"-1'	16	J-	***1,520***	J-	129	J-	0.469	J-	3.78	J-	6.27	J-	***27,900***	J-	***457***	J-	1.95	J-	15.8	J-	4	UJ-	1.5	UJ-
RAWTP-15 0-2"	5.3	J-	***385***	J-	95.8	J-	0.365	J-	0.2	UJ-	13.3	J-	1,200	J-	161	J-	0.508	J-	10.7	J-	4	UJ-	1.5	UJ-
RAWTP-10 2"-1'	6.7	J-	***559***	J-	125	J-	0.507	J-	1.99	J-	8.34	J-	***13,800***	J-	187	J-	0.54	J-	13.6	J-	4	UJ-	1.5	UJ-
RAWTP-04 1-2'	3.6	J-	***185***	J-	128	J-	0.528	J-	1	J-	11.7	J-	***8,560***	J-	71.9	J-	0.445	J-	17.1	J-	4	UJ-	1.5	UJ-
RAWTP-14 1-2'	2	UJ-	***99.6***	J-	95.2	J-	0.637	J-	0.2	J-	4.71	J-	702	J-	17.9	J-	0.415	J-	12	J-	4	UJ-	1.5	UJ-
RAWTP-15 1-2'	2.5	J-	***104***	J-	145	J-	0.908	J-	0.2	UJ-	9.67	J-	948	J-	43.7	J-	0.133	J-	15.2	J-	4	UJ-	1.5	UJ-
RAWTP-06 1-2'	2	UJ-	***69.3***	J-	113	J-	0.26	J-	0.2	UJ-	12.8	J-	417	J-	14.2	J-	0.065	J-	16.4	J-	4	UJ-	1.5	UJ-
RAWTP-18 1-2'	2	UJ-	***15.7***	J-	82.8	J-	0.479	J-	0.2	UJ-	5.02	J-	52.2	J-	7.83	J-	0.055	J-	8.65	J-	4	UJ-	1.5	UJ-
RAWTP-27 1-2'	2	UJ-	***58.1***	J-	81.3	J-	0.546	J-	0.2	UJ-	3.45	J-	492	J-	16.7	J-	0.163	J-	7.95	J-	4	UJ-	1.5	UJ-

Notes:

Test pit data were collected for remedial action planning purposes and are not used in risk evaluations.

SRL = Soil Remediation Level

mg/Kg = milligrams per kilogram

NS = no standard

Q = Qualifiers

J- = Estimated value with low bias

UJ- = Estimated reporting unit with a low bias

Bold, italicized font indicates an exceedance of the residential SRL.

Stippled cells indicate an exceedance of the non-residential SRL.

Sampling depth included in sample ID.

Table 3-10: April 2008 Test Pit Soil Sample Analytical Results for SPLP Metals (Bulk Samples)

Constituent	Antimony (mg/L)	Sb Q	Arsenic (mg/L)	As Q	Barium (mg/L)	Ba Q	Beryllium (mg/L)	Be Q	Cadmium (mg/L)	Cd Q	Chromium (mg/L)	Cr Q	Copper (mg/L)	Cu Q	Lead (mg/L)	Pb Q	Mercury (mg/L)	Hg Q	Nickel (mg/L)	Ni Q	Selenium (mg/L)	Se Q	Thallium (mg/L)	Tl Q	pH (standard units)
Industrial Area																									
RAWTP-03 2"-1'	0.0069	J-	0.34	J-	0.004	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	0.13	J-	0.0075	UJ-	0.0011	J-	0.01	UJ-	0.003	UJ-	0.001	UJ-	9.25
RAWTP-24 0-2"	0.0031	J-	0.07	J-	0.004	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	0.11	J-	0.0079	J-	0.0022	J-	0.01	UJ-	0.003	UJ-	0.001	UJ-	9.14
RAWTP-20 0-2"	0.0125	J-	0.254	J-	0.02	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	0.46	J-	0.018	J-	0.0003	J-	0.01	UJ-	0.003	UJ-	0.001	UJ-	8.72
RAWTP-09 2"-1	0.0149	J-	0.597	J-	0.02	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	0.67	J-	0.0138	J-	0.0039	J-	0.01	UJ-	0.003	UJ-	0.001	UJ-	8.93
RAWTP-18 0-2"	0.0163	J-	0.595	J-	0.02	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	0.49	J-	0.0075	UJ-	0.0006	J-	0.01	UJ-	0.003	UJ-	0.001	UJ-	8.87
RAWTP-12 0-2"	0.0223	J-	0.767	J-	0.02	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	2.74	J-	0.117	J-	0.0025	J-	0.01	UJ-	0.003	UJ-	0.001	UJ-	9.18
RAWTP-04 0-2"	0.0163	J-	1.63	J-	0.03	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	0.97	J-	0.0264	J-	0.0012	J-	0.01	UJ-	0.0031	J-	0.001	UJ-	8.86
RAWTP-17 2"-1'	0.0242	J-	0.236	J-	0.02	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	0.15	J-	0.0075	UJ-	0.0056	J-	0.01	UJ-	0.003	UJ-	0.001	UJ-	7.87
RAWTP-15 0-2"	0.003	UJ-	0.008	J-	0.03	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	1.97	J-	0.0075	UJ-	0.0002	R	0.01	UJ-	0.003	UJ-	0.001	UJ-	5.58
RAWTP-10 2"-1'	0.0257	J-	1.44	J-	0.04	J-	0.002	UJ-	0.004	J-	0.006	UJ-	2.12	J-	0.0075	UJ-	0.0026	J-	0.01	UJ-	0.0049	J-	0.001	UJ-	6.91
RAWTP-04 1-2'	0.0116	J-	0.985	J-	0.01	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	0.09	J-	0.0075	UJ-	0.0037	J-	0.01	UJ-	0.0031	J-	0.001	UJ-	9.05
RAWTP-14 1-2'	0.0214	J-	0.404	J-	0.03	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	0.27	J-	0.0076	J-	0.0006	J-	0.01	UJ-	0.003	UJ-	0.001	UJ-	9.26
RAWTP-15 1-2'	0.0042	J-	0.104	J-	0.02	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	0.12	J-	0.0075	UJ-	0.0002	J-	0.01	UJ-	0.003	UJ-	0.001	UJ-	8.67
RAWTP-06 1-2'	0.0137	J-	0.552	J-	0.007	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	0.02	J-	0.0075	UJ-	0.0002	R	0.01	UJ-	0.003	UJ-	0.001	UJ-	9.04
RAWTP-18 1-2'	0.003	UJ-	0.076	J-	0.008	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	0.03	J-	0.0075	UJ-	0.0004	J-	0.01	UJ-	0.003	UJ-	0.001	UJ-	8.28
RAWTP-27 1-2'	0.0039	J-	0.314	J-	0.004	J-	0.002	UJ-	0.002	UJ-	0.006	UJ-	0.08	J-	0.0075	UJ-	0.0006	J-	0.01	UJ-	0.003	UJ-	0.001	UJ-	8.57

Notes:
Test pit data were collected for remedial action planning purposes and are not used in risk evaluations.
Q = Qualifiers
J- = Estimated value with low bias
R = Rejected value
UJ- = Estimated reporting unit with a low bias
SPLP = Synthetic Precipitation Leaching Procedure
mg/L = milligrams per liter
Sampling depth included in sample ID.

Table 4-1: Datasets Used for VSP Analyses

Sample Dataset	Samples	Arsenic (mg/Kg)
Eastern Mountain Front		
B&C 1998	*10-154*	31
	10-165	130
	10-181	150
	10-205	93
	10-226	22
Golder February 2008	*EMF-07HHRA-001*	39.1
	EMF-07HHRA-002	283
	EMF-07HHRA-003	123
	EMF-07HHRA-004	258
	EMF-07HHRA-005	387
	EMF-07HHRA-006	149
Golder April 2009	*EMF-07HHRA-002N1*	158
	EMF-07HHRA-002S1	225
	EMF-07HHRA-003N1	162
	EMF-07HHRA-003W1	272
	EMF-07HHRA-004N1	211
	EMF-07HHRA-004W1	251
	EMF-07HHRA-005N1	210
	EMF-07HHRA-005E1	291
Eastern Mountain Front Statistics	**Average**	181
	Standard Deviation	97.8
	Median	162
	Coefficient of Variation	0.54
	Maximum	387
	Minimum	22
	Count	19
Industrial Area (Excluding Stack Zone)		
B&C 1998	*10-113*	100
	10-114	68
	10-115	120
	10-116	160
	10-123	120
	10-124	88
	10-125	76
	10-126	2
	10-127	4
	10-134	190
	10-135	10
	10-136	150
	10-138	20
	10-144	88
	10-145	200
	10-146	150
	10-147	330
	10-149	29
	10-155	340
	10-156	81
	10-157	380
	10-158	10
	10-161	49
	10-163	220
	10-164	78
	10-166	51
	10-167	490
	10-179	250
	10-180	56
	10-182	330
	10-183	120
	10-184	20
	10-185	22
	10-186	9

Table 4-1: Datasets Used for VSP Analyses

Sample Dataset	Samples	Arsenic (mg/Kg)
B&C 1998 Cont.	*10-187*	320
	10-189	28
	10-190	12
	10-193	40
	10-194	46
	10-195	360
	10-197	31
	10-204	13
	10-207	70
	10-208	13
	10-210	18
	10-220	150
	10-221	72
	10-223	67
	10-227	72
	10-250	240
	10-251	470
	10-252	280
	10-256	350
	10-266	420
	10-267	420
	10-268	6
	10-270	25
	10-278	57
	10-279	12
	10-282	11
	10-242	460
	10-260	290
	10-261	210
	10-262	44
	10-273	60
	10-274	170
	10-276	95
	10-277	30
	10-283	84
	10-284	33
	10-285	46
	10-286	36
Industrial Area (Excluding Stack Zone) Statistics	**Average**	133
	Standard Deviation	136
	Median	74
	Coefficient of Variation	1.03
	Maximum	490
	Minimum	2
	Count	72

Table 4-1: Datasets Used for VSP Analyses

Sample Dataset	Samples	Arsenic (mg/Kg)
Industrial Area (Stack Zone Only)		
B&C 1998	*10-209*	600
	10-248	660
	10-269	730
	10-196	770
	10-192	810
	10-254	840
	10-228	910
	10-191	930
	10-249	960
	10-188	1,000
	10-219	1,000
	10-231	1,000
	10-206	1,100
	10-213	1,300
	10-211	1,400
	10-232	1,400
	10-253	1,400
	10-230	1,500
	10-212	1,700
	10-217	1,800
	10-229	2,200
	10-255	2,200
	10-215	2,300
	10-214	2,400
	10-222	2,500
	10-236	2,500
	10-216	2,800
	10-218	3,500
	10-235	3,500
	10-241	4,000
	10-233	4,500
	10-234	4,500
	10-237	5,100
Industrial Area (Stack Zone Only) Statistics	**Average**	1,934
	Standard Deviation	1259
	Median	1,400
	Coefficient of Variation	0.65
	Maximum	5,100
	Minimum	600
	Count	33
North Mountain Front		
B&C 1998	*10-117*	80
	10-118	120
	10-119	130
	10-120	120
	10-128	200
	10-129	110
	10-130	260
	10-131	70
	10-139	18
	10-140	280
	10-141	300
	10-142	140
	10-143	100
	10-150	6
	10-151	360
	10-152	150
	10-153	280
	10-162	190
	10-109	150
	10-110	79

Table 4-1: Datasets Used for VSP Analyses

Sample Dataset	Samples	Arsenic (mg/Kg)
Golder February 2008	*NMF-07HHRA-001*	45.3
	NMF-07HHRA-002	31.9
	NMF-07HHRA-003	64.3
	NMF-07HHRA-004	87.0
	NMF-07HHRA-005	176
	NMF-07HHRA-006	51.3
	NMF-07HHRA-007	53.1
	NMF-07HHRA-008	37.6
	NMF-07HHRA-009	94.3
	NMF-07HHRA-010	35.9
	NMF-07HHRA-011	32.4
	NMF-07HHRA-012	87.1
	NMF-07HHRA-013	44.0
	NMF-07HHRA-014	69.1
	NMF-07HHRA-015	223
Golder April 2009	*NMF-07HHRA-005E1*	97.4
	NMF-07HHRA-005S1	79.1
North Mountain Front Statistics	**Average**	120
	Standard Deviation	87.9
	Median	94
	Coefficient of Variation	0.73
	Maximum	360
	Minimum	6
	Count	37
Silver King Wash		
B&C 1998	*10-100*	80
	10-111	79
	10-112	110
	10-122	39
	10-133	82
Golder February 2008	*SKW-07HHRA-001*	61.4
	SKW-07HHRA-002	80.6
	SKW-07HHRA-003	55.9
	SKW-07HHRA-004	23.0
	SKW-07HHRA-005	125
	SKW-07HHRA-006	127
Silver King Wash Statistics	**Average**	78
	Standard Deviation	33.1
	Median	80
	Coefficient of Variation	0.42
	Maximum	127
	Minimum	23
	Count	11

Notes:
All results detected, no qualifiers needed.
B&C = Brown and Caldwell
mg/Kg = milligrams per kilogram
VSP = Visual sampling protocol

Table 4-2: Summary of Constituents of Concern By Dataset

Parameter	Regulatory Limits		B&C 1998 10-Series Samples (Arsenic and Copper)			B&C 1998 10-Series Samples (Additional Constituents)			Golder 2001 Samples (Gray Layer)			Golder 2001 Samples Underlying Layer			Golder 2008-2009 Samples			Totals		
	Non-Residential SRL (mg/Kg)	Minimum GPL (mg/Kg)	Number of Sample Results	Number Exceeding Non-Residential SRLs	Number Exceeding GPLs	Number of Sample Results	Number Exceeding Non-Residential SRLs	Number Exceeding GPLs	Number of Sample Results	Number Exceeding Non-Residential SRLs	Number Exceeding GPLs	Number of Sample Results	Number Exceeding Non-Residential SRLs	Number Exceeding GPLs	Number of Sample Results	Number Exceeding Non-Residential SRLs	Number Exceeding GPLs	Number of Sample Results	Number Exceeding Non-Residential SRLs	Number Exceeding GPLs
Aluminum	920,000	---	0	NA	---	0	NA	---	10	0	---	9	0	---	0	NA	---	19	0	0
Antimony	410	**35**	0	NA	NA	10	**0**	**1**	10	0	**5**	9	0	0	0	NA	NA	29	0	6
Arsenic	**10**	**290**	135	**128**	**48**	25	**25**	**11**	10	**10**	**10**	9	**9**	**3**	41	**41**	**2**	220	213	74
Barium	170,000	12,000	0	NA	NA	10	0	0	10	0	0	9	0	0	0	NA	NA	29	0	0
Beryllium	1,900	23	0	NA	NA	10	0	0	10	0	0	9	0	0	0	NA	NA	29	0	0
Boron	200,000	---	0	NA	---	0	NA	---	10	0	---	9	0	---	0	NA	---	19	0	0
Cadmium	510	**29**	0	NA	NA	10	0	**1**	10	0	0	9	0	0	0	NA	NA	29	0	1
Chromium	65	590	0	NA	NA	10	0	0	10	0	0	9	0	0	0	NA	NA	29	0	0
Cobalt	13,000	---	0	NA	---	0	NA	---	10	0	---	9	0	---	0	NA	---	19	0	0
Copper	**41,000**	---	135	**10**	---	25	**6**	---	10	**6**	---	9	0	---	41	0	---	220	22	0
Iron	---	---	0	---	---	0	---	---	10	---	---	9	---	---	0	---	---	19	0	0
Lead	**800**	**290**	0	NA	NA	10	**2**	**5**	10	**6**	**9**	9	0	0	41	**2**	**10**	70	10	24
Manganese	32,000	---	0	NA	---	0	NA	---	10	0	---	9	0	---	0	NA	---	19	0	0
Mercury	310	12	0	NA	NA	10	0	0	10	0	0	9	0	0	0	NA	NA	29	0	0
Molybdenum	5,100	---	0	NA	---	0	NA	---	10	0	---	9	0	---	0	NA	---	19	0	0
Nickel	20,000	590	0	NA	NA	10	0	0	10	0	0	9	0	0	0	NA	NA	29	0	0
Selenium	5,100	290	0	NA	NA	10	0	0	10	0	0	9	0	0	0	NA	NA	29	0	0
Silver	5,100	---	0	NA	---	10	0	---	10	0	---	9	0	---	0	NA	---	29	0	0
Strontium	610,000	---	0	NA	---	0	NA	---	10	0	---	9	0	---	0	NA	---	19	0	0
Thallium	**67**	**12**	0	NA	NA	10	**2**	**2**	10	0	0	9	0	0	0	NA	NA	29	2	2
Tin	610,000	---	0	NA	---	0	NA	---	10	0	---	9	0	---	0	NA	---	19	0	0
Vanadium	1,000	---	0	NA	---	0	NA	---	10	0	---	9	0	---	0	NA	---	19	0	0
Zinc	310,000	---	0	NA	---	0	0	---	10	0	---	9	0	---	0	NA	---	19	0	0

Notes:
* Seven of the arsenic results in this series overlap with the 1998 B&C Additional Constituents samples.
NA = not analyzed
--- = No SRL/GPL
GPL = Groundwater Protection Level
SRL = Soil Remediation Level
Stippled cells indicate an exceedance of the non-residential SRL.
Blue cells indicate an exceedance of the GPL.
All samples sieved to <250 µm.
Table includes data for samples collected at surface and at varying depths.
Green cells = Does not include samples listed in both Tables 3-1 and 3-2

Table 4-3: Summary of Constituents of Concern by Land Area

Parameter	Regulatory Limits		East Mountain Front			Industrial Area			North Mountain Front		
	Non-Residential SRL (mg/Kg)	Minimum GPL (mg/Kg)	Number of Sample Results	Number Exceeding Non-residential SRLs	Number Exceeding GPLs	Number of Sample Results	Number Exceeding Non-residential SRLs	Number Exceeding GPLs	Number of Sample Results	Number Exceeding Non-residential SRLs	Number Exceeding GPLs
Aluminum	920,000	---	0	0	0	19	0	0	0	0	0
Antimony	410	35	0	NA	NA	29	0	6	0	NA	NA
Arsenic	10	290	20	20	2	149	143	70	39	38	2
Boron	200,000	---	0	0	0	19	0	0	0	0	0
Cadmium	510	29	0	NA	NA	29	0	1	0	NA	NA
Cobalt	13,000	---	0	0	0	19	0	0	0	0	0
Copper	41,000	---	20	0	---	149	22	---	39	0	---
Iron	---	---	0	0	0	19	0	0	0	0	0
Lead	800	290	15	1	9	29	8	14	19	1	1
Manganese	32,000	---	0	0	0	19	0	0	0	0	0
Strontium	610,000	---	0	0	0	19	0	0	0	0	0
Thallium	67	12	0	0	0	29	2	2	0	0	0

Parameter	Regulatory Limits		Silver King Wash			Totals		
	Non-Residential SRL (mg/Kg)	Minimum GPL (mg/Kg)	Number of Sample Results	Number Exceeding Non-residential SRLs	Number Exceeding GPLs	Number of Sample Results	Number Exceeding Non-residential SRLs	Number Exceeding GPLs
Aluminum	920,000	---	0	NA	---	**19**	**0**	**0**
Antimony	410	35	0	NA	NA	**29**	**0**	**6**
Arsenic	10	290	12	12	0	**220**	**213**	**74**
Boron	200,000	---	0	NA	---	**19**	**0**	**0**
Cadmium	510	29	0	NA	NA	**29**	**0**	**1**
Cobalt	13,000	---	0	NA	---	**19**	**0**	**0**
Copper	41,000	---	12	0	---	**220**	**22**	**0**
Iron	---	---	0	---	---	**19**	**0**	**0**
Lead	800	290	7	0	0	**70**	**10**	**24**
Manganese	32,000	---	0	NA	---	**19**	**0**	**0**
Strontium	610,000	---	0	NA	---	**19**	**0**	**0**
Thallium	67	12	0	NA	NA	**29**	**2**	**2**

Notes:
NA = Not analyzed
mg/Kg = milligrams per kilogram
GPL = Groundwater Protection Level
SRL = Soil Remediation Level
--- = No SRL/GPL
Stippled cells indicate an exceedance of the non-residential SRL.
Blue cells indicate an exceedance of the GPL.
All samples sieved to <250 µm.
Table includes data for samples collected at surface and at varying depths.

Table 4-4: Alternative GPL Calculations for April 2008 Test Pit Data[1]

Sample Name	Total Antimony (Sb) (mg/Kg)	Total Sb Q	SPLP Sb (mg/L)	SPLP Sb Q	Sb R	Total Arsenic (As) (mg/Kg)	Total As Q	SPLP As (mg/L)	SPLP As Q	As R	Total Cadmium (Cd) (mg/Kg)	Total Cd Q	SPLP Cd (mg/L)	SPLP Cd Q	Cd R	Total Lead (Pb) (mg/Kg)	Total Pb Q	SPLP Pb (mg/L)	SPLP Pb Q	Pb R	Total Thallium (Tl) (mg/Kg)	Total Tl Q	SPLP Tl (mg/L)	SPLP Tl Q	Tl R
Industrial Area																									
RAWTP-03 2"-1'	2.3	J-	0.0069	J-	333	98.5	J-	0.34	J-	290	0.53	J-	0.002	UJ-	265	51.3	J-	0.0075	UJ-	6840	1.5	UJ-	0.001	UJ-	1500
RAWTP-24 0-2"	3.1	J-	0.0031	J-	1000	157	J-	0.07	J-	2243	0.53	J-	0.002	UJ-	265	110	J-	0.0079	J-	13924	1.5	UJ-	0.001	UJ-	1500
RAWTP-20 0-2"	4	J-	0.0125	J-	320	144	J-	0.254	J-	567	0.3	J-	0.002	UJ-	150	143	J-	0.018	J-	7944	1.5	UJ-	0.001	UJ-	1500
RAWTP-09 2"-1	4.7	J-	0.0149	J-	315	355	J-	0.597	J-	595	1.88	J-	0.002	UJ-	940	161	J-	0.0138	J-	11667	1.5	UJ-	0.001	UJ-	1500
RAWTP-18 0-2"	8.4	J-	0.0163	J-	515	567	J-	0.595	J-	953	1.83	J-	0.002	UJ-	915	264	J-	0.0075	UJ-	35200	1.5	UJ-	0.001	UJ-	1500
RAWTP-12 0-2"	11.2	J-	0.0223	J-	502	949	J-	0.767	J-	1237	4.65	J-	0.002	UJ-	2325	489	J-	0.117	J-	4179	1.5	UJ-	0.001	UJ-	1500
RAWTP-04 0-2"	16	J-	0.0163	J-	982	1070	J-	1.63	J-	656	5.78	J-	0.002	UJ-	2890	448	J-	0.0264	J-	16970	1.5	UJ-	0.001	UJ-	1500
RAWTP-17 2"-1'	16	J-	0.0242	J-	661	1520	J-	0.236	J-	6441	3.78	J-	0.002	UJ-	1890	457	J-	0.0075	UJ-	60933	1.5	UJ-	0.001	UJ-	1500
RAWTP-15 0-2"	5.3	J-	0.003	UJ-	1767	385	J-	0.008	J-	48125	0.2	UJ-	0.002	UJ-	100	161	J-	0.0075	UJ-	21467	1.5	UJ-	0.001	UJ-	1500
RAWTP-10 2"-1'	6.7	J-	0.0257	J-	261	559	J-	1.44	J-	388	1.99	J-	0.004	J-	498	187	J-	0.0075	UJ-	24933	1.5	UJ-	0.001	UJ-	1500
RAWTP-04 1-2'	3.6	J-	0.0116	J-	310	185	J-	0.985	J-	188	1	J-	0.002	UJ-	500	71.9	J-	0.0075	UJ-	9587	1.5	UJ-	0.001	UJ-	1500
RAWTP-14 1-2'	2	UJ-	0.0214	J-	93	99.6	J-	0.404	J-	247	0.2	J-	0.002	UJ-	100	17.9	J-	0.0076	J-	2355	1.5	UJ-	0.001	UJ-	1500
RAWTP-15 1-2'	2.5	J-	0.0042	J-	595	104	J-	0.104	J-	1000	0.2	UJ-	0.002	UJ-	100	43.7	J-	0.0075	UJ-	5827	1.5	UJ-	0.001	UJ-	1500
RAWTP-06 1-2'	2	UJ-	0.0137	J-	146	69.3	J-	0.552	J-	126	0.2	UJ-	0.002	UJ-	100	14.2	J-	0.0075	UJ-	1893	1.5	UJ-	0.001	UJ-	1500
RAWTP-18 1-2'	2	UJ-	0.003	UJ-	667	15.7	J-	0.076	J-	207	0.2	UJ-	0.002	UJ-	100	7.83	J-	0.0075	UJ-	1044	1.5	UJ-	0.001	UJ-	1500
RAWTP-27 1-2'	2	UJ-	0.0039	J-	513	58.1	J-	0.314	J-	185	0.2	UJ-	0.002	UJ-	100	16.7	J-	0.0075	UJ-	2227	1.5	UJ-	0.001	UJ-	1500
RAWTP-BFD-06	3.7	J-	0.0171	J-	216	133	J-	0.31	J-	429	0.2	UJ-	0.002	UJ-	100	143	J-	0.0373	J-	3834	1.5	UJ-	0.001	UJ-	1500
BFD-10	2	UJ-	0.0038	J-	526	34.7	J-	0.222	J-	156	0.2	UJ-	0.002	UJ-	100	19.1	J-	0.0075	UJ-	2547	1.5	UJ-	0.001	UJ-	1500
Maximum	16		0.0257		1767	1520		1.63		48125	6		0.004		2890	489		0.117		60933	1.5		0.001		1500
Minimum	2		0.003		93	15.7		0.008		126	0.2		0.002		100	7.83		0.0075		1044	1.5		0.001		1500
Arizona AQWS [2]	0.006					0.05					0.005					0.05					0.002				
Alternative GPL (AWQS) [2,3]	**164**					**1,839**					**146**					**15,289**					**879**				
EPA MCL [4]						0.01																			
Alternative GPL (EPA) [4,3]						**368**																			

Notes:

NA = Not available

AWQS (mg/L) = aquifer water quality standard.

[1] Data used in these calculations are total metals analysis of bulk (non-seived) soil samples

[2] Arizona Maximum Contaminant Level (mg/L), equivalent to AWQS.

[3] Based on minimum R

[4] U.S. Environmental Protection Agency Maximum Contaminant Level (revised October 2001)

Highlighted cells exceed the alternative GPL (EPA), no exceedances against the Arizona AWQS

$R = \frac{\text{Total (mg/kg)}}{\text{Leachable (mg/L)}}$

Alternative GPL (mg/Kg) =((292.9)*(minimum R)*(AWQS or MCL)

Arsenic example equation: (292.9 x 126 mg/kg x 0.05 mg/L)

SPLP = Synthetic Precipitation Leaching Procedure

U = The analyte was analyzed for, but was not detected

mg/Kg = milligrams per kilogram

mg/L = milligrams per liter

Table 4-5: Alternative GPL Calculations for February 2009 Surface Soil Data[1]

Sample Name	Total Arsenic (As) (mg/Kg)	SPLP As (mg/L)	As R	Total Lead (Pb) (mg/Kg)	SPLP Pb (mg/L)	Pb R
East Mountain Front						
EMF-07HHRA-002N1	158	0.096	1649	236	0.032	7421
EMF-07HHRA-002S1	225	0.120	1875	293	0.023	13022
EMF-07HHRA-003N1	162	0.162	1000	323	0.056	5737
EMF-07HHRA-003W1	272	0.218	1248	514	0.086	5963
EMF-07HHRA-004N1	211	0.149	1416	226	0.028	8043
EMF-07HHRA-004W1	251	0.160	1569	304	0.031	9806
EMF-07HHRA-005N1	210	0.660	318	155	0.054	2849
EMF-07HHRA-005E1	291	0.087	3349	307	0.083	3703
North Mountain Front						
NMF-07HHRA-005S1	79.1	0.039	2018	178	0.025	7265
NMF-07HHRA-005E1	97.4	0.065	1501	271	0.033	8287
Maximum	291	0.660	3349	514	0.086	13022
Minimum R	79	0.039	318	155	0.023	2849
Arizona AQWS [2]	0.050			0.050		
Alternative GPL (AWQS) [2,3]	**4,660**			**41,727**		
EPA MCL [4]	0.010					
Alternative GPL (EPA) [4,3]	**932**					

Notes:

All results detected, no qualifiers needed

AWQS (mg/L) = aquifer water quality standard

[1] Data used in these calculations are total metals analysis of bulk (non-seived) soil samples

[2] Arizona Maximum Contaminant Level (mg/L), equivalent to AWQS.

[3] Based on minimum R

[4] U.S. Environmental Protection Agency Maximum Contaminant Level (revised October 2001)

Highlighted cells exceed the alternative GPL

$$R = \frac{\text{Total (mg/kg)}}{\text{Leachable (mg/L)}}$$

Alternative GPL (mg/Kg) =((292.9)*(minimum R)*AWQS)

Arsenic example equation: (292.9 x 318 mg/Kg x 0.01 mg/L)

SPLP = Synthetic Precipitation Leaching Procedure

mg/Kg = milligrams per kilogram

mg/L = milligrams per liter

Table 4-6: Surface Water Analytical Results Near Silver King Wash

Designated Use/Sample ID	Aluminum (Al) (mg/L)	Al Q	Antimony (Sb) (mg/L)	Sb Q	Arsenic (As) (mg/L)	As Q	Beryllium (Be) (mg/L)	Be Q	Boron (B) (mg/L)	B Q	Cadmium (Cd) (mg/L)	Cd Q	Calcium (Ca) (mg/L)	Ca Q	Chromium (Cr) (mg/L)	Cr Q	Copper (Cu) (mg/L)	Cu Q	Iron (Fe) (mg/L)	Fe Q	Lead (Pb) (mg/L)	Pb Q	Magnesium (Mg) (mg/L)	Mg Q	Manganese (Mn) (mg/L)	Mn Q	Mercury (Hg) (mg/L)	Hg Q
MGSKW004.11																												
Dissolved (D) Results																												
August 16, 2007	0.500	U	0.005	U	0.024	---	0.0005	U	---	---	0.001	U	---	---	0.010	U	0.03	---	---	---	---	---	---	---	---	---	0.0002	U *
January 28, 2008	0.500	U	0.005	U	0.012	---	0.0005	U	---	---	0.0005	U	49	---	0.010	U	0.0074	---	---	---	---	---	14	---	---	---	0.0002	U *
February 22, 2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.0068	---	---	---	---	---	---	---	---	---	---	---
Total (T) Results																												
August 16, 2007	62	---	0.005	U	0.069	---	0.0059	---	0.100	U	0.012	---	300	---	0.013	---	0.8	---	54	---	0.74	---	79	---	11	---	0.00081	---
January 28, 2008	33	---	0.005	U	0.037	---	0.0017	---	0.100	U	0.0012	---	---	---	0.010	U	0.19	---	40	---	0.14	---	---	---	1.6	---	0.0002	U
February 22, 2010	---	---	---	---	---	---	---	---	---	---	---	---	140	---	---	---	0.306	---	---	---	0.343	---	93	---	---	---	---	---
MGSKW004.60																												
Dissolved (D) Results														---														
December 7, 2007	0.500	U	0.005	U	0.012	---	0.0005	U	---	---	0.001	U	15	---	0.010	U	0.011	---	---	---	---	---	2.6	---	---	---	0.0002	U *
December 11, 2007	0.500	U	0.005	U	0.0096	---	0.0005	U	---	---	0.0005	U *	62	---	0.010	U	0.0064	---	---	---	---	---	17	---	---	---	0.0002	U *
January 22, 2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.0097	---	---	---	0.0007	---	---	---	---	---	---	---
Total (T) Results																												
December 7, 2007	33	---	0.005	U	0.054	---	0.0039	---	0.100	U	0.001	U	--	---	0.010	U	0.58	---	23	---	0.26	---	---	---	4.3	---	0.0004	---
December 11, 2007	20	---	0.005	U	0.020	---	0.0016	---	0.100	U	0.001	U	---	---	0.010	U	0.15	---	28	---	0.11	---	---	---	1.6	---	0.0002	U
January 22, 2010	---	---	---	---	---	---	---	---	---	---	---	---	180	---	---	---	0.544	---	---	---	0.525	---	100	---	---	---	---	---

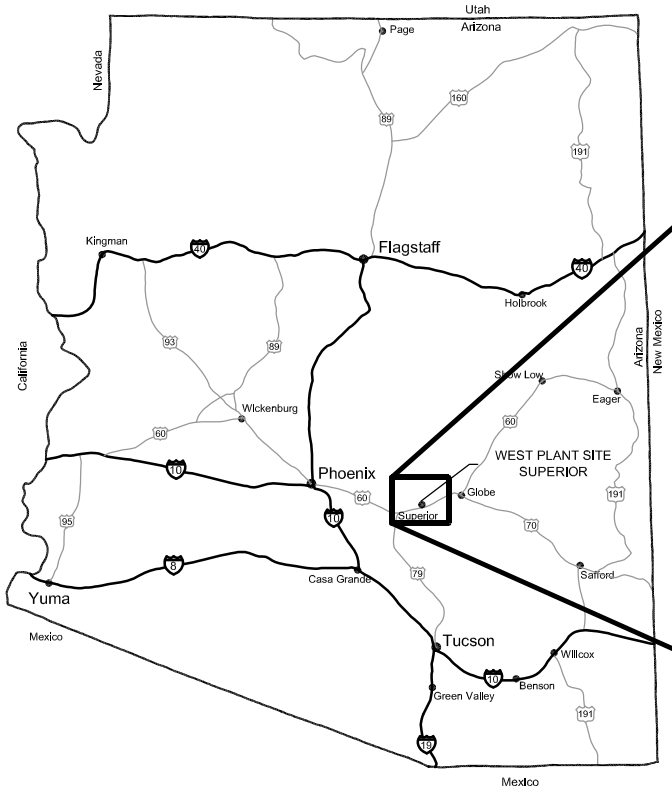
Notes:
mg/L = milligrams per liter
SU = standard untis
µmhos/cm = micromhos per centimeter
°C = degrees centigrade
*Hardness calculated at the laboratory by multiplying the sum of Ca and Mg (in milliequivalents per liter) by 50.
mg/L as $CaCO_3$ = milligrams per liter as calcium carbonate
--- denotes "no standard" or "not analyzed"

Table 4-6: Surface Water Analytical Results Near Silver King Wash

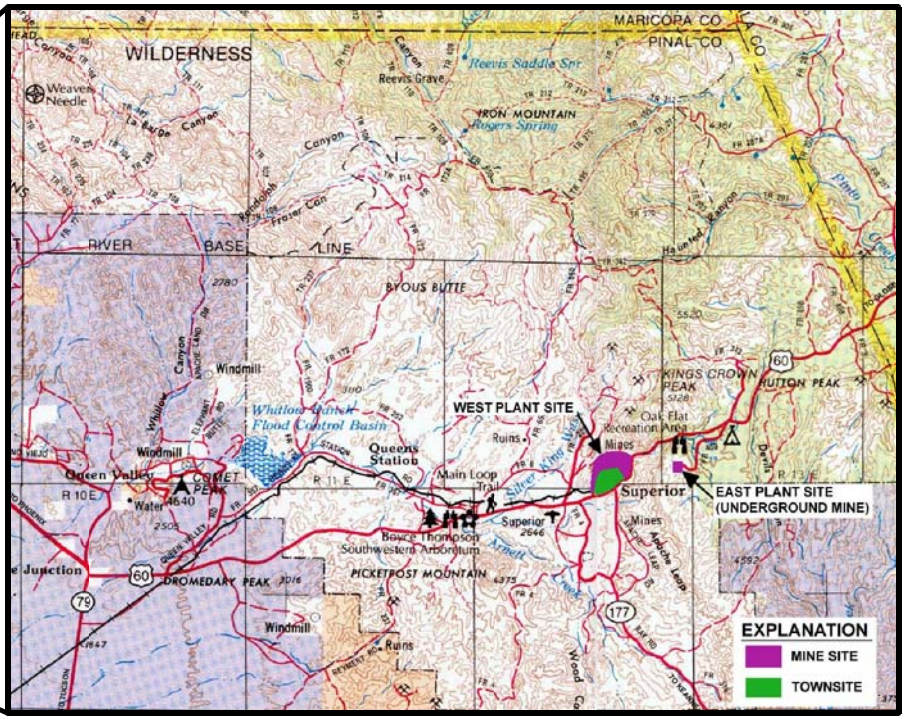
Designated Use/Sample ID	Selenium (Se) (mg/L)	Se Q	Sulfate (SO_4^{2-}) (mg/L)	SO_4^{2-} Q	Zinc (Zn) (mg/L)	Zn Q	Dissolved Oxygen** (mg/L)	pH (SU)	Specific Conductance (25°C) (umhos/cm)	Temperature (°C)	Hardness (Ca, Mg calculated)* (mg/L as CaCO3)
MGSKW004.11											
Dissolved (D) Results											
August 16, 2007	---	---	---	---	0.050	U	---	7.51	164	23.6	1074
January 28, 2008	---	---	---	---	0.050	U	---	8.15	384	11.68	180
February 22, 2010	---	---	---	---	---	---	---	---	---	---	640
Total (T) Results											
August 16, 2007	0.005	U *	---	---	0.64	---	---	---	---	---	---
January 28, 2008	0.005	U *	91	---	0.2	---	---	---	---	---	---
February 22, 2010	---	---	---	---	---	---	---	---	---	---	---
MGSKW004.60											
Dissolved (D) Results											
December 7, 2007	---	---	---	---	0.050	U		8.25	58.2	11.6	96
December 11, 2007	---	---	---	---	0.050	U	12.56	7.80	450	6.21	220
January 22, 2010	---	---	---	---	---	---	---	7.97	---	5.35	880
Total (T) Results											
December 7, 2007	0.005	U *	---	---	0.3	---	---	---	---	---	---
December 11, 2007	0.005	U *	---	---	0.16	---	---	---	---	---	---
January 22, 2010	---	---	---	---	---	---	---	---	---	---	---

Notes:
mg/L = milligrams per liter
SU = standard untis
µmhos/cm = micromhos per centimeter
°C = degrees centigrade
*Hardness calculated at the laboratory by multiplying the sum of Ca and Mg (in milliequivalents per liter) by 50.
mg/L as $CaCO_3$ = milligrams per liter as calcium carbonate
--- denotes "no standard" or "not analyzed"

FIGURES



STATE OF ARIZONA



REFERENCE: ARIZONA ATLAS & GAZETTEER (1993).

LOCATION MAP

PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

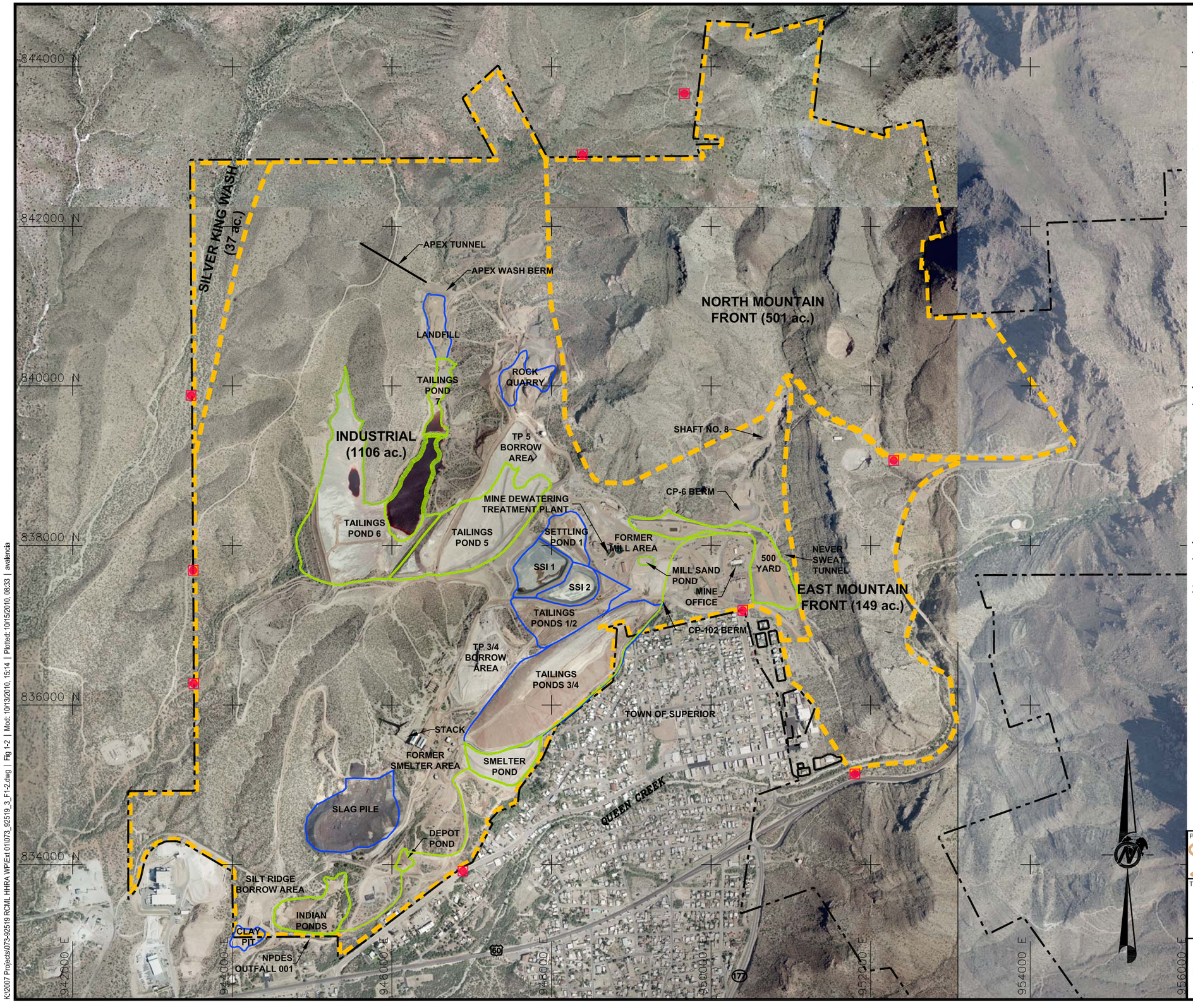
TITLE

SITE LOCATION MAP

Golder Associates

PROJECT No	073-92519-01.1		FILE No.	073_92519_1_F1-1
DESIGN	OM	10/04/10	SCALE	NA REV. 0
CADD	ANV	10/04/10		
CHECK	OM	10/04/10		
REVIEW	DC	10/04/10		

FIGURE 1-1



LEGEND

- PROPERTY LINE
- APP FACILITIES
- OTHER FACILITIES
- LAND AREA BOUNDARY
- ACCESS POINTS

NOTE

1.) SSI = SLUDGE STORAGE IMPOUNDMENT.

REFERENCES

1.) 2008 AERIAL PHOTOGRAPH PROVIDED BY RCML.

2.) 2005 USGS DOQQ AERIAL PHOTOGRAPH OBTAINED FROM ALRIS.

1200 0 1200

SCALE 1" to 1200' FEET

PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

TITLE

GEOGRAPHIC SCOPE OF THE WEST PLANT SITE

Golder Associates

PROJECT No. 073-92519-01.1			FILE No. 073_92519_3_F1-2.DWG		
DESIGN	KJ	11/06/07	SCALE	SHOWN	REV. 1
CADD	NIL	11/06/07	FIGURE 1-2		
CHECK	KJ	11/07/07			
REVIEW	DC	11/08/07			

K:\2007 Projects\073-92519 RCML HHRA WP\Ext 01\073_92519_3_F1-2.dwg | Fig 1-2 | Mod: 10/13/2010, 15:14 | Plotted: 10/15/2010, 08:33 | avalencia

MGFOW001-22
MGDTQ000-10
MGSVW000-01
MGDTY000-05
MGFOW000-48
MGFOW000-28
MGPEW000-02
MGSKW004-60
MGSKW004-11
MGSKW000-07

SILVER KING WASH AREA (137 ac.)
APEX TUNNEL
APEX WASH BERM
LANDFILL
TAILINGS POND 7
ROCK QUARRY
INDUSTRIAL AREA (1196 ac.)
TP 5 BORROW AREA
NORTH MOUNTAIN FRONT AREA (501 ac.)
SHAFT NO. 6
TAILINGS POND 6
TAILINGS POND 5
SETTLING POND 1
SSI 1
SSI 2
TAILINGS PONDS 1/2
FORMER MILL AREA
MILL SAND POND
MINE OFFICE
500 YARD
NEVER SWEAT TUNNEL
EAST MOUNTAIN FRONT AREA (149 ac.)
TP 3/4 BORROW AREA
TAILINGS PONDS 3/4
TOWN OF SUPERIOR
STACK
FORMER SMELTER AREA
SMELTER POND
SLAG PILE
DEPOT POND
SELT RIDGE BORROW AREA
INDIAN PONDS
CRAY PIT
NPDES DISCHARGE POINT 001

852000 N
850000 N
848000 N
846000 N
844000 N
842000 N
840000 N
838000 N
836000 N
834000 N
832000 N
830000 N
828000 N
930000 E
932000 E
934000 E
936000 E
938000 E
940000 E
942000 E
944000 E
946000 E
948000 E
950000 E
952000 E
954000 E
956000 E
958000 E

LEGEND

- PROPERTY LINE
- APP FACILITIES
- OTHER FACILITIES
- LAND AREA BOUNDARY
- MGDTY000-05 — SURFACE WATER SAMPLE LOCATION

NOTE

1.) SURFACE WATER SAMPLES COLLECTED BY ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY FOR TOTAL MAXIMUM DAILY LOAD ANALYSES.

REFERENCES

1.) 2010 DigitalGlobe AERIAL PHOTOGRAPH PROVIDED BY GOOGLE EARTHPro.

2500 0 2500
SCALE FEET

PROJECT
Resolution Copper Mining

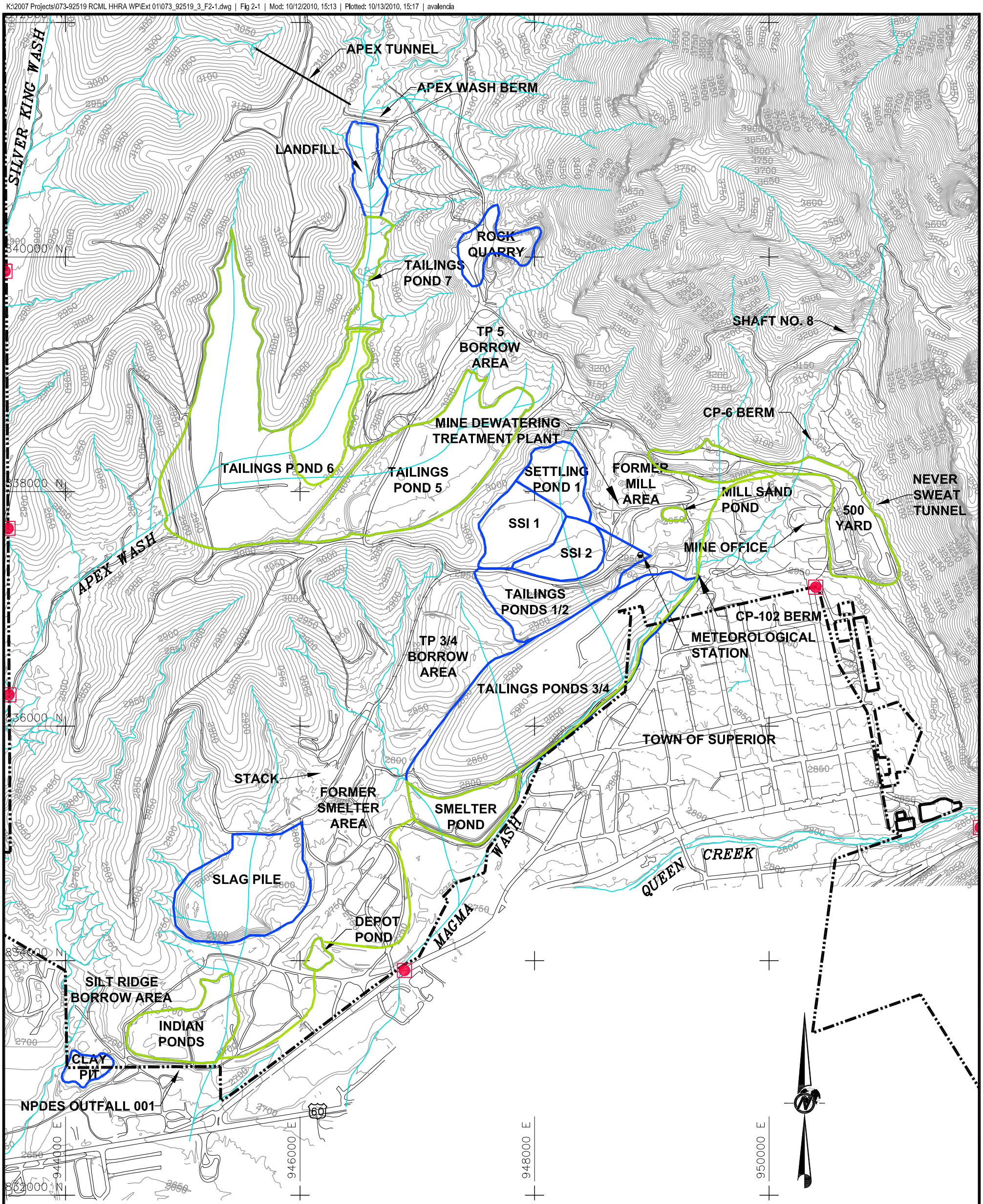
SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

TITLE
SURFACE WATER SAMPLE LOCATIONS FOR TOTAL MAXIMUM DAILY LOAD ANALYSES

Golder Associates

PROJECT No. 073-92519-01.1			FILE No. 073_92519_2_F1-3.DWG		
DESIGN	KJ	11/06/07	SCALE	SHOWN	REV. 2
CADD	NIL	11/06/07	FIGURE 1-3		
CHECK	KJ	11/07/07			
REVIEW	DC	11/08/07			

K:\2007 Projects\073-92519 RCML HHRA WP\Ext 01\073_92519_2_F1-3.dwg | SilverKing | Mod: 11/23/2010, 16:24 | Plotted: 11/23/2010, 16:25 | avalencia



LEGEND

- EXISTING TOPOGRAPHY (C.I. = 10 FT)
- EXISTING ROADS
- HISTORICAL DRAINAGE
- EXISTING FENCE
- PROPERTY LINE
- APP FACILITIES
- OTHER FACILITIES
- ACCESS POINTS

REFERENCES

1.) 2004 TOPOGRAPHY PROVIDED BY DARLING SURVEYING AND ENVIRONMENTAL.

2.) HISTORICAL DRAINAGE TAKEN FROM PLATE 1, "GEOLOGIC MAP OF THE SUPERIOR MINING AREA ARIZONA", ARIZONA BUREAU OF MINES BULLETIN 150, GEOLOGIC SERIES No. 16, UNIVERSITY OF ARIZONA BULLETIN Vol. XIII, No.1, JANUARY 1, 1942.

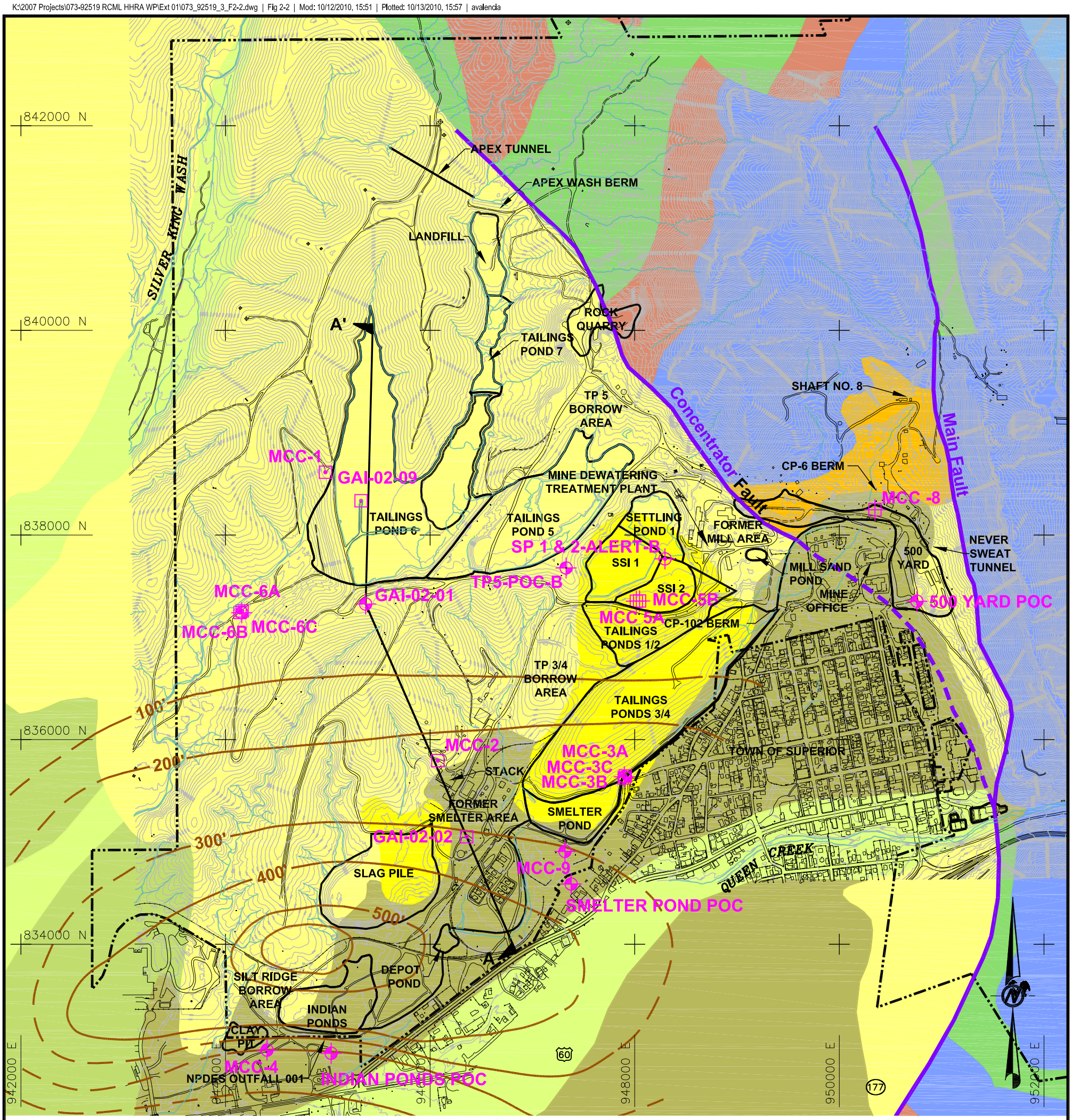
PROJECT
Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

TITLE
WEST PLANT SITE SURFACE WATER HYDROLOGY AND SITE TOPOGRAPHY

Golder Associates

PROJECT No. 073-92519-01.1			FILE No. 073_92519_3_F2-1.DWG	
DESIGN	JM	06-24-08	SCALE 1"=800'	REV. 2
CADD	ACF	06/24/08	FIGURE 2-1	
CHECK	JM	06/24/08		
REVIEW	MB	06/04/08		



LEGEND

- EXISTING TOPOGRAPHY (C.I. = 10 FT)
- EXISTING ROADS
- EXISTING DRAINAGE
- EXISTING FENCE
- EXISTING FAULT (DASHED WHERE INFERRED)
- PROPERTY LINE
- APP FACILITIES
- OTHER FACILITIES
- POINT OF COMPLIANCE (POC) WELL LOCATION
- ALERT WELL LOCATION
- NON–APP WELL LOCATION (ACTIVE MONITORING)
- ABANDONED NON–APP WELL LOCATION
- MUDSTONE ISOPACH CONTOUR (100 FT INTERVAL)
- A — A' CROSS–SECTION

REFERENCES

1.) 2004 TOPOGRAPHY PROVIDED BY DARLING SURVEYING AND ENVIRONMENTAL.

2.) GEOLOGY FROM *DI–13 – GEOLOGIC MAP OF PORTIONS OF THE GLOBE 30' X 60' QUADRANGLE, ARIZONA*, ARIZONA GEOLOGIC SURVEY, 1998.

1000 0 1000

Scale: 1" = 1000' AZC NAD83

GEOLOGIC LEGEND

- EXTENT OF TAILINGS SLAG PILES, AND FILL IN 1968
- HOLOCENE ALLUVIUM
- QUARTERNARY ALLUVIAL FAN REMNANTS DEEPLY INCISED
- QUARTERNARY ALLUVIUM, UNDIFFERENTIATED
- TERTIARY/ QUARTERNARY GILA CONGLOMERATE
- TERTIARY APACHE LEAP TUFF
- PENNSYLVANIAN NACO LIMESTONE
- MISSISSIPPIAN, DEVONIAN, AND CAMBRIAN SEDIMENTARY ROCKS
- PRECAMBRIAN DIABASE
- PRECAMBRIAN APACHE GROUP

PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

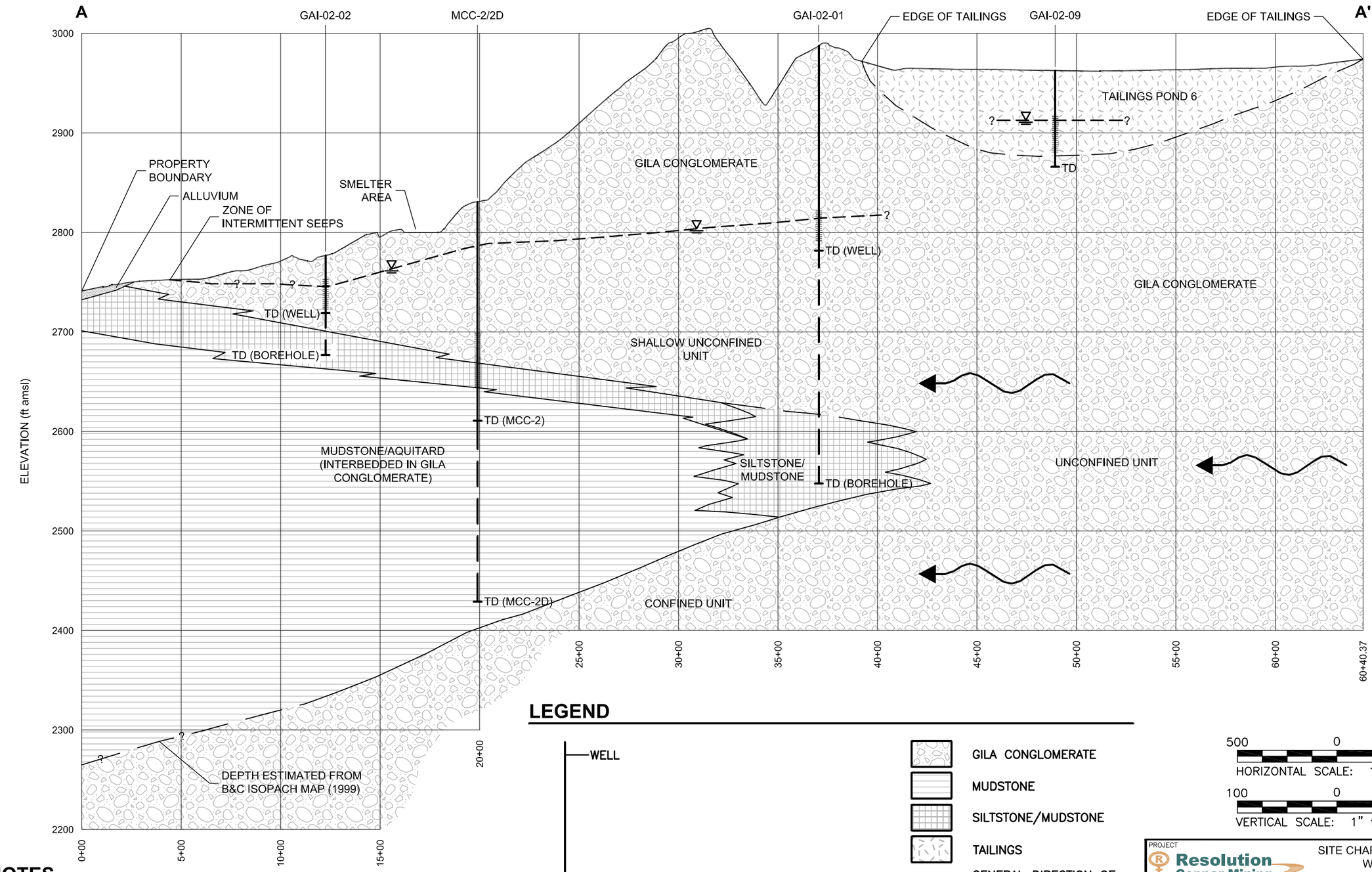
TITLE

WELL LOCATION AND GEOLOGIC MAP

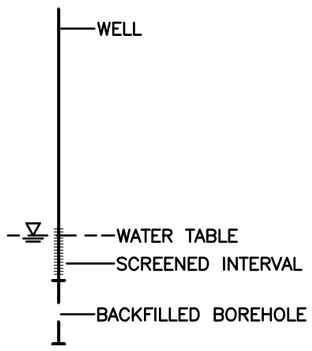
Golder Associates

PROJECT No. 073–92519–01.1			FILE No. 073_92519_3_F2–2.DWG	
DESIGN	JM	06–24–08	SCALE 1"=1000'	REV. 2
CADD	ACF	06/24/08		
CHECK	JM	06/24/08		
REVIEW	MB	06/04/08		

FIGURE 2-2



LEGEND



- GILA CONGLOMERATE
- MUDSTONE
- SILTSTONE/MUDSTONE
- TAILINGS
- GENERAL DIRECTION OF GROUNDWATER FLOW

TD = TOTAL DEPTH

500 0 500
HORIZONTAL SCALE: 1" to 500"

100 0 100
VERTICAL SCALE: 1" to 100"

NOTES

1.) BROWN AND CALDWELL WATER LEVELS TAKEN APRIL 23 AND 24, 2002.

2.) GOLDER WATER LEVELS TAKEN MAY 28, 2002.

3.) FT AMSL = FEET ABOVE MEAN SEA LEVEL

PROJECT
Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

TITLE

GEOLOGIC CROSS-SECTION

Golder Associates

PROJECT No. 073-92519-01.1			FILE No. 073_92519_3_F2-3.DWG		
DESIGN	JM	06-24-08	SCALE 1"=500'	REV.	2
CADD	ACF	06/24/08			
CHECK	JM	06/24/08			
REVIEW	MB	06/04/08			

FIGURE 2-3

Map Document: L:\Site\Resolution\Maps\WPSCharacterization\11x17_GWEContours_201005.mxd / Modified 10/12/2010 4:55:08 PM / Plotted 10/12/2010 4:55:09 PM by CPollock

LEGEND

Well with Groundwater Elevation
- Shallow or Upper Unstratified Unit
- Deep Confined Unit

Shallow or Upper Unstratified Unit
- Groundwater Elevation Contour (50 ft)
- Inferred Groundwater Elevation Contour (50 ft)

Deep Confined Unit
- Groundwater Elevation Contour (50 ft)
- Inferred Groundwater Elevation Contour (50 ft)
- Approximate Direction of Regional Gradient

- Approximate Northern Extent of Mudstone Aquitard
- Fault

0 500 1,000 2,000
SCALE 1:12,000 FEET

NOTES

SP1&2-Alert-B well is completed in the Settling Ponds 1 & 2 Tailings.

REFERENCES

1) Projection: Transverse Mercator Datum: NAD 83 Coordinate System: NAD 1983 State Plane Arizona Central FIPS 0202 Feet.
2) Regional flow direction from Montgomery and Associates, 2001. Summary of Hydrogeologic Data for the Superior Area, Pinal and Gila Counties, Arizona. November 27, 2001
3) March 2006 Aerial Provided by Arizona State Land Department.
4) 2008 Aerial Provided by RCML.

PROJECT
Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

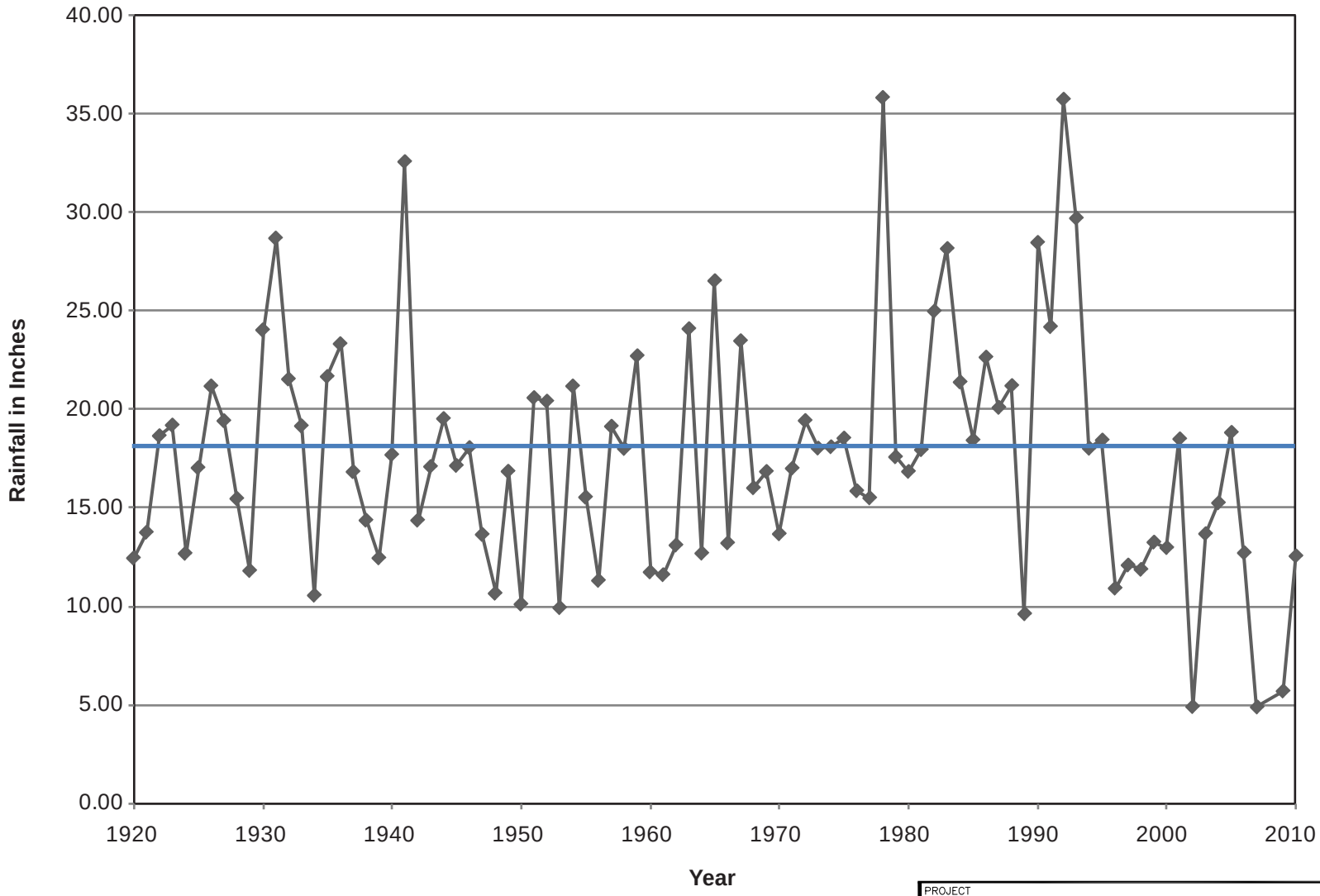
TITLE

WATER TABLE CONTOUR MAP AND DEEP POTENTIOMETRIC SURFACE 2ND QUARTER 2010

Golder Associates
Tucson, Arizona

PROJECT No.
073-92519-01

FIGURE 2-4



PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

TITLE

TOTAL ANNUAL RAINFALL

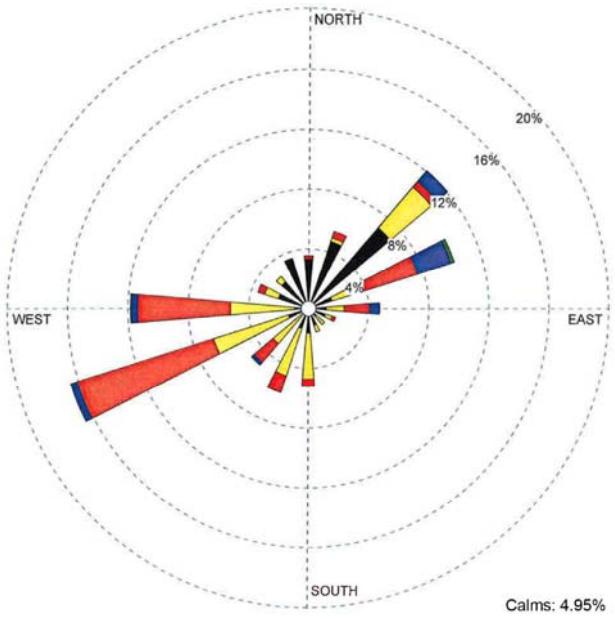
Golder Associates

PROJECT No.	07392519-01.1		FILE No.	07392519011fig2-5.ai	
DESIGN	JM	06-24-08	SCALE	NA	REV. 1
CADD	AMP	10-08-10			
CHECK	JM	06-24-08			
REVIEW	MB	06-24-08			

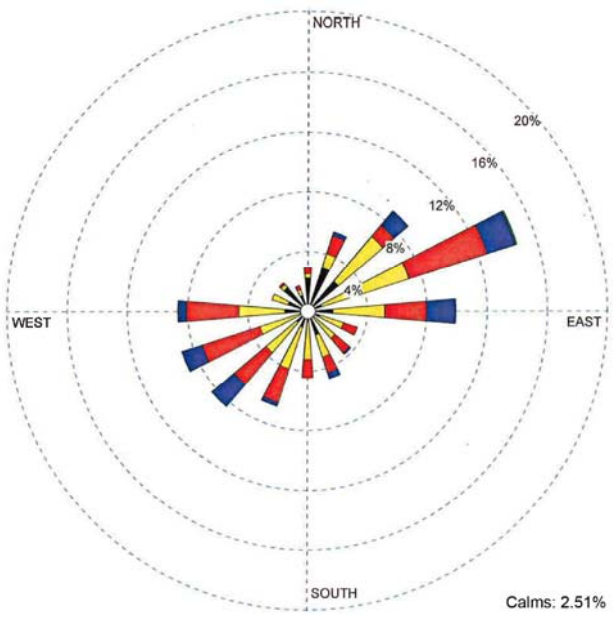
FIGURE 2-5

Note: Annual rainfall, town of Superior 1920 to 2010

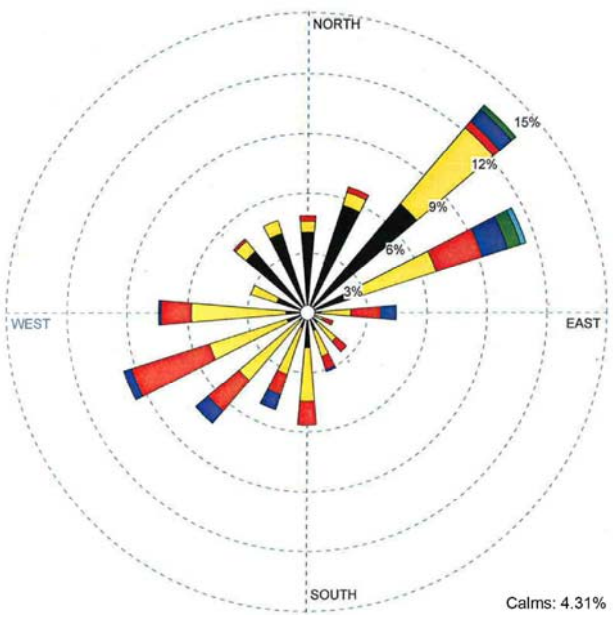
Drawing file: 07392519C006r1.dwg Jun 27, 2008 – 10:51am



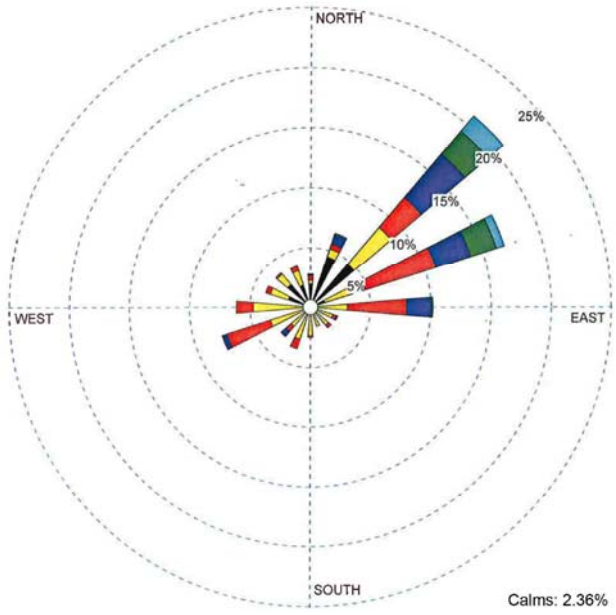
AUGUST 2002



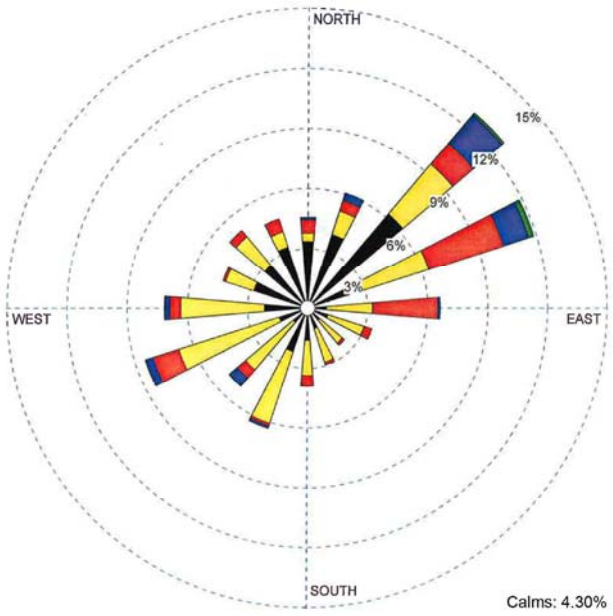
SEPTEMBER 2002



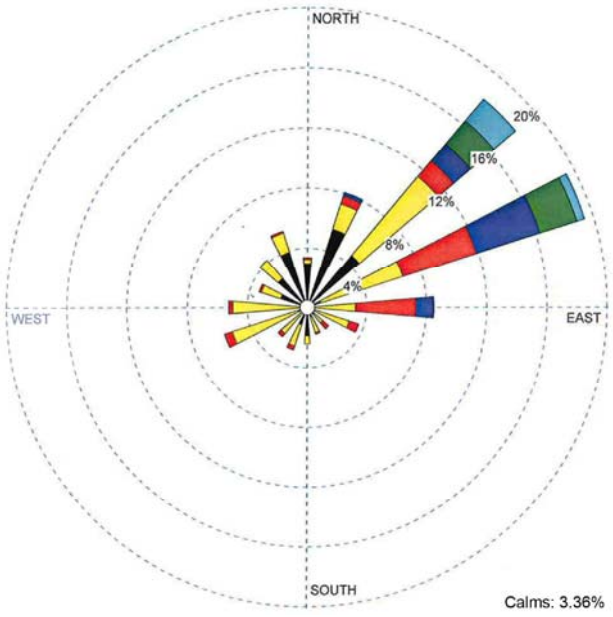
OCTOBER 2002



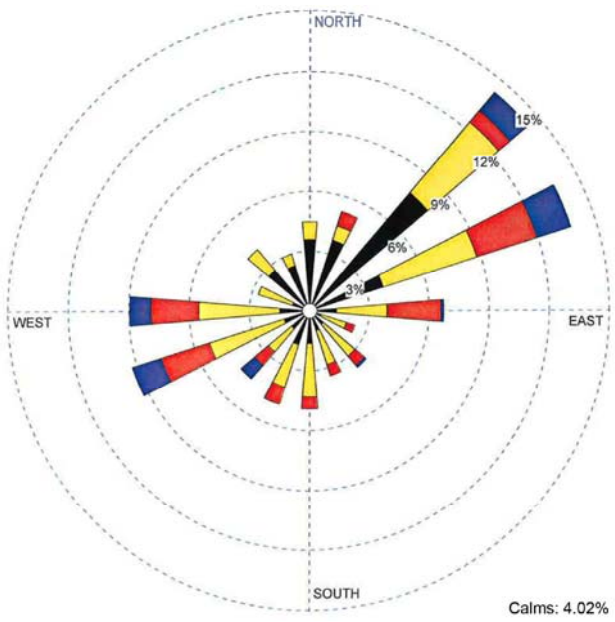
NOVEMBER 2002



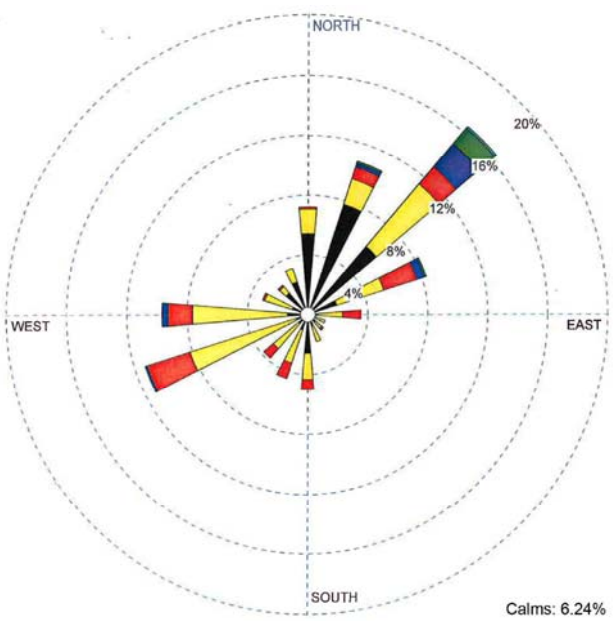
DECEMBER 2002



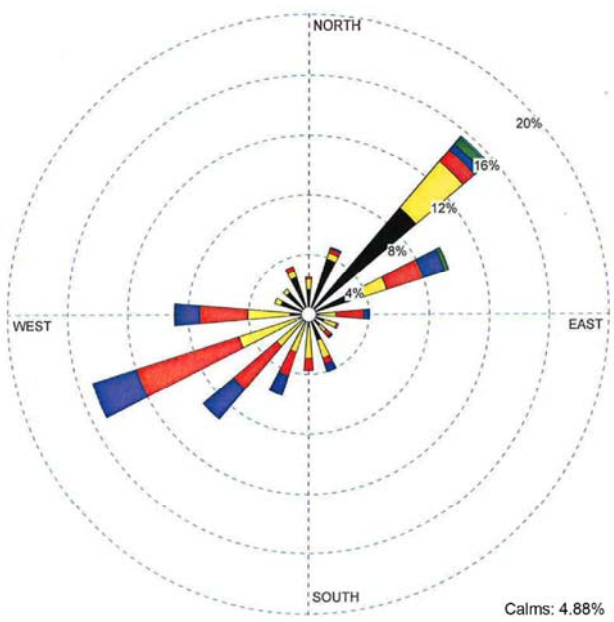
JANUARY 2003



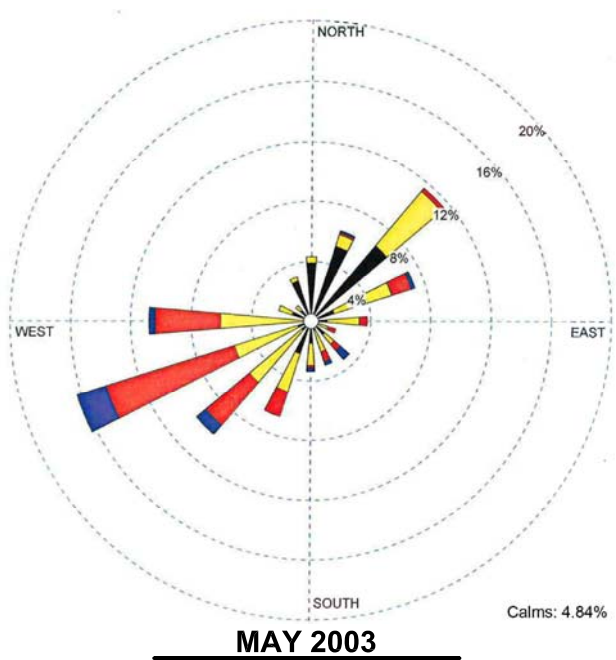
FEBRUARY 2003



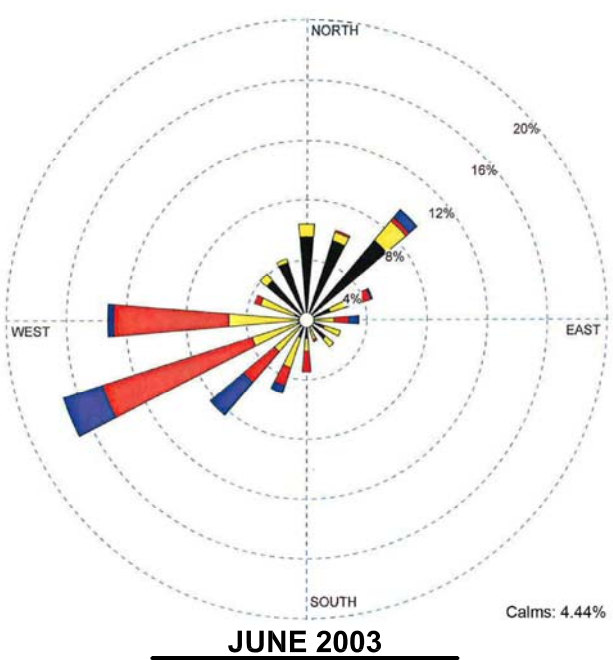
MARCH 2003



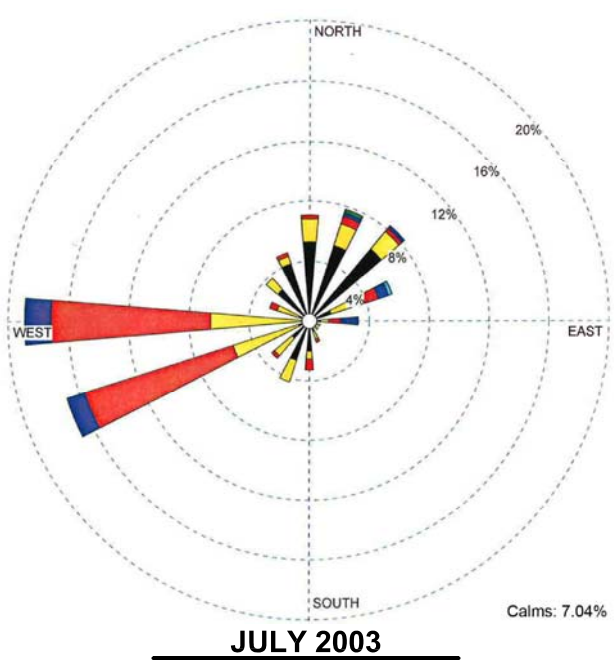
APRIL 2003



MAY 2003



JUNE 2003



JULY 2003

LEGEND

WIND SPEED (Knots)

- >= 22
- 17 - 21
- 11 - 17
- 7 - 11
- 4 - 7
- 1 - 4

PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

TITLE

WIND ROSES FOR WEST PLANT SITE AUGUST 2002 THROUGH JULY 2003

Golder Associates

PROJECT No.		073=92519.2	FILE No.	073_92519_2_F2-6.DWG
DESIGN	JM	06-24-08	SCALE AS-SHOWN	REV. 1
CADD	ACF	06/24/08		
CHECK	JM	06/24/08		
REVIEW	MB	06/04/08		

FIGURE 2-6

LEGEND

LAND AREA BOUNDARY

ACCESS POINTS

NOTE

REFERENCES

1.) AERIAL PHOTOGRAPH PROVIDED BY GOOGLE EARTH PRO, IMAGE FROM NOV 7, 2006 – JUNE 8, 2007

500 0 500

SCALE 1" to 500'(APPROX) FEET

PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

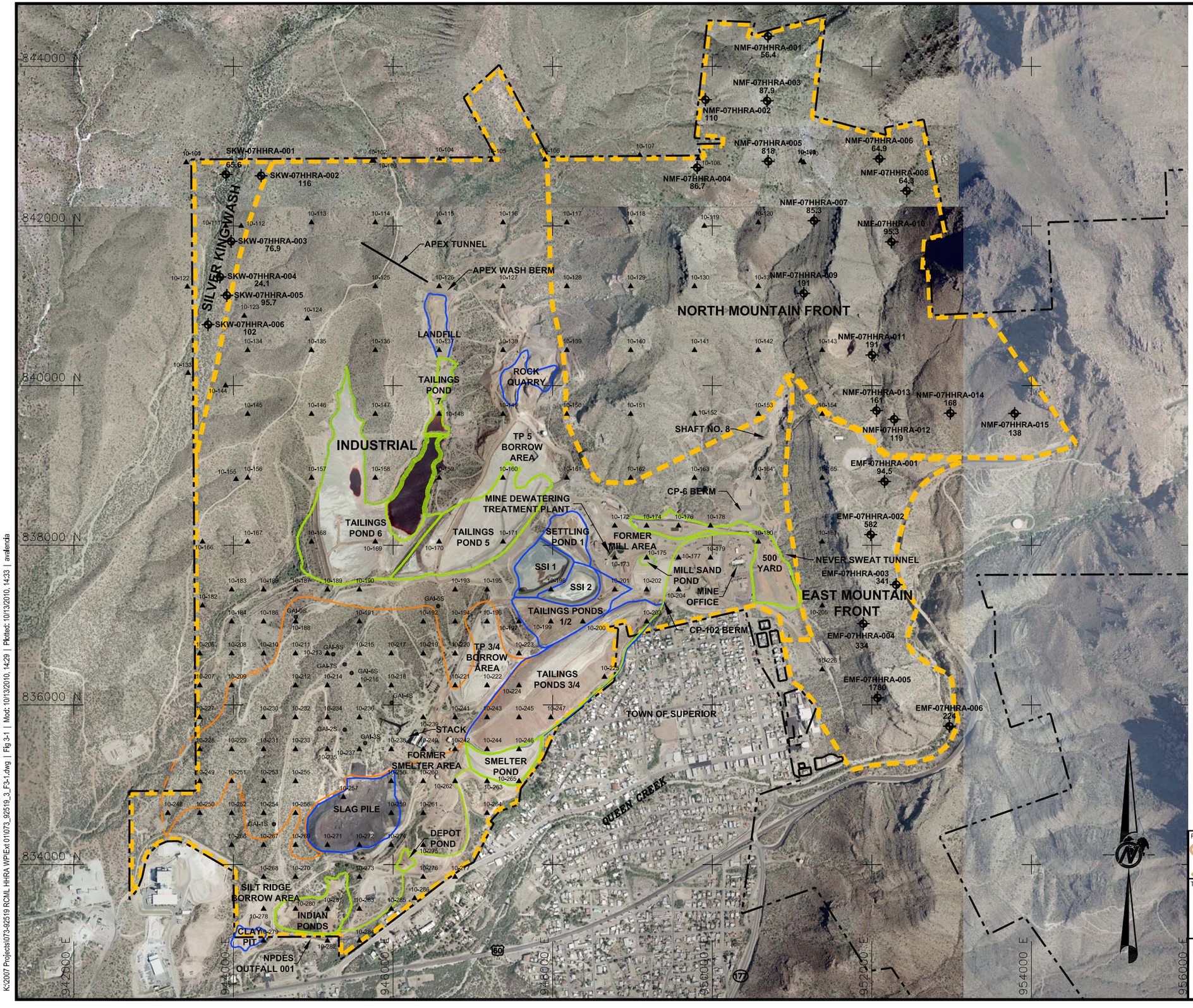
TITLE

OBLIQUE VIEW OF THE EAST AND NORTH MOUNTAIN FRONT AREAS

Golder Associates

PROJECT No. 073-92519-01.1			FILE No.073_9251901_1_F2-7.DWG	
DESIGN	DC	01/10/11	SCALE NTS SHOWN	REV. 0
CADD	SES	01/10/11		
CHECK	DC	01/10/11		
REVIEW	DC	01/10/11		

FIGURE 2-7



LEGEND

- PROPERTY LINE
- APP FACILITIES
- OTHER FACILITIES
- LAND AREA BOUNDARY
- 500 — STACK ZONE
- GAI-1S — GOLDER 2001 SAMPLE LOCATIONS AND SAMPLE IDs
- ▲10-278 — B&C 1998 10 SERIES SAMPLE LOCATIONS AND SAMPLE IDs
- NMF-07HHRA-001 — GOLDER 2008 SAMPLE LOCATIONS AND SAMPLE IDS

NOTES

1.) 2001 AND 2008 SAMPLES COLLECTED BY GOLDER; ALL OTHER SAMPLES COLLECTED BY B & C (1998).

2.) SSI = SLUDGE STORAGE IMPOUNDMENT.

REFERENCES

1.) 2008 AERIAL PHOTOGRAPH PROVIDED BY RCML.

2.) 2005 USGS DOQQ AERIAL PHOTOGRAPH OBTAINED FROM ALRIS.

1200 0 1200
SCALE 1" to 1200' FEET

PROJECT
Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

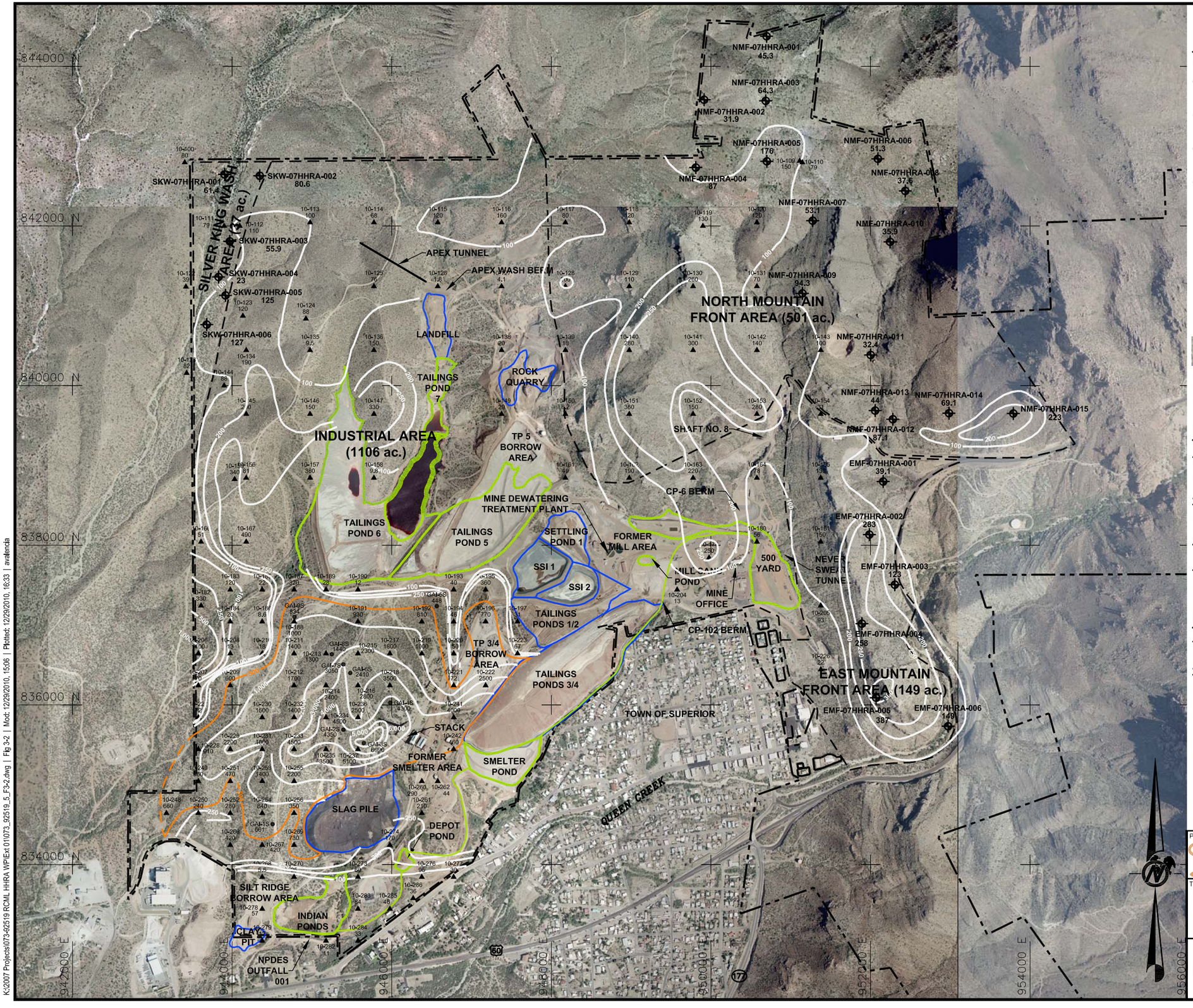
TITLE

SOIL SAMPLE LOCATIONS

Golder Associates

PROJECT No. 073-92519-01.1			FILE No. 073_92519_3_F3-1.DWG		
DESIGN	JM	06-24-08	SCALE 1"=1200'	REV.	2
CADD	ACF	06/24/08			
CHECK	JM	06/24/08			
REVIEW	MB	06/04/08			

FIGURE 3-1



LEGEND

- PROPERTY LINE
- APP FACILITIES
- OTHER FACILITIES
- LAND AREA BOUNDARY
- NMF-07HHRA-001 — 2008 SAMPLES
- GAI-1S — 2001 SAMPLES
- ▲10-278 — 10 SERIES SAMPLES
- 500 — ARSENIC CONCENTRATION (mg/Kg)
- 1,000 — ARSENIC ISOPLETH IN mg/Kg (DASHED WHERE INFERRED)
- 500 — STACK ZONE

NOTES

1.) 2001 AND 2008 SAMPLES COLLECTED BY GOLDER; ALL OTHER SAMPLES COLLECTED BY B & C (1998).

2.) SAMPLES FROM WASTE MATERIALS (E.G. SLAG, TAILINGS) NOT USED TO DEVELOP ISOPLETHS.

3.) SURFACE SAMPLES USED TO DEVELOP ISOPLETHS.

4.) SSI = SLUDGE STORAGE IMPOUNDMENT.

REFERENCES

1.) 2008 AERIAL PHOTOGRAPH PROVIDED BY RCML.

2.) 2005 USGS DOQQ AERIAL PHOTOGRAPH OBTAINED FROM ALRIS.

1200 0 1200
SCALE 1" to 1200' FEET

PROJECT
Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

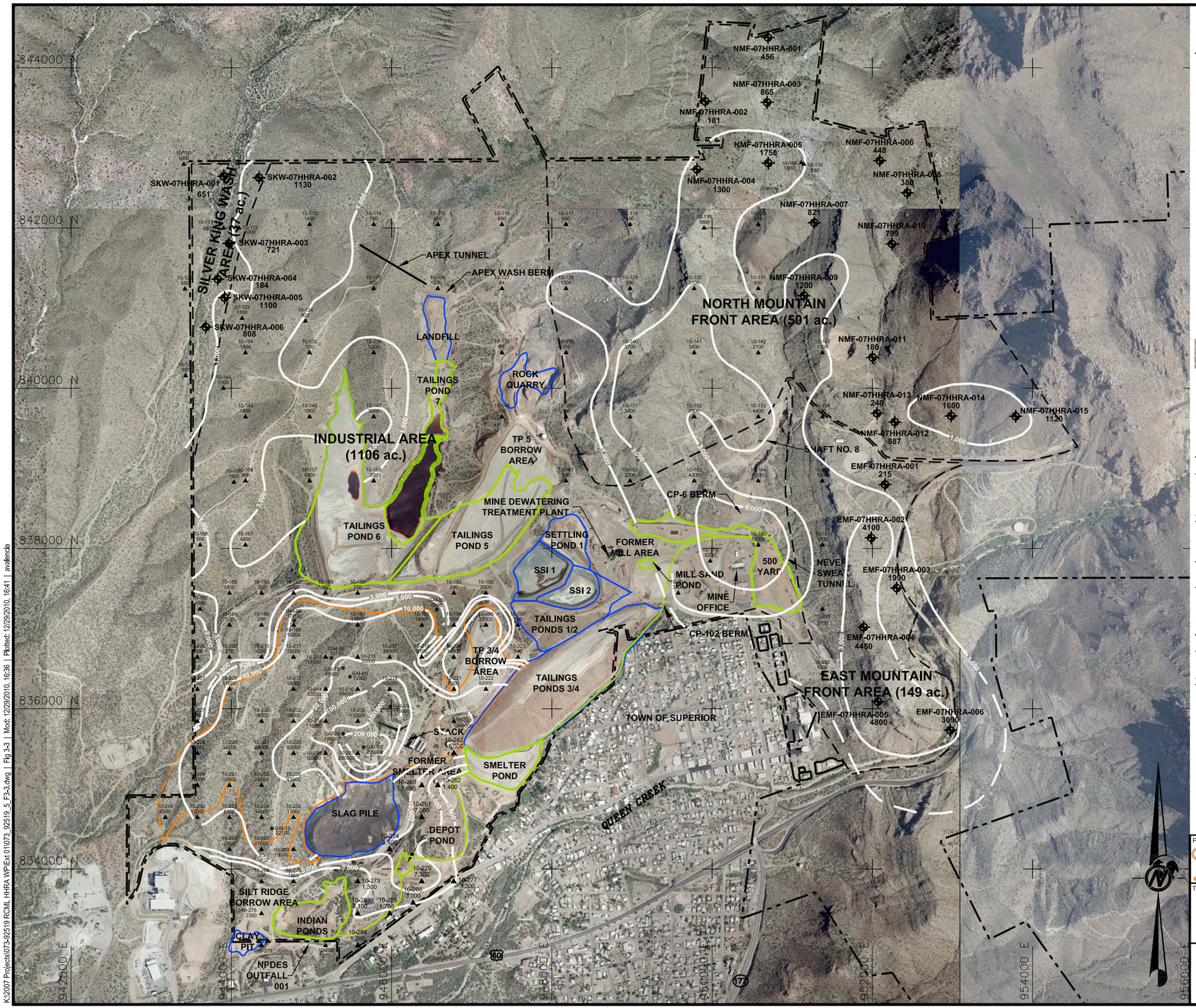
TITLE

ARSENIC ISOPLETHS FOR SOIL

Golder Associates

PROJECT No. 073-92519-01.1			FILE No. 073_92519_5_F3-2.DWG		
DESIGN	JM	06-24-08	SCALE 1"=1200'	REV.	4
CADD	ACF	06/24/08			
CHECK	JM	06/24/08	FIGURE 3-2		
REVIEW	MB	06/04/08			

K:\2007 Projects\073-92519 RCML HHRA WP\Ext 01\073_92519_5_F3-2.dwg | Fig 3-2 | Mod: 12/29/2010, 15:06 | Plotted: 12/29/2010, 16:33 | avalencia



LEGEND

- PROPERTY LINE
- APP FACILITIES
- OTHER FACILITIES
- LAND AREA BOUNDARY
- NMF-07HHRA-001 — 2008 SAMPLES
- GAI-1S — 2001 SAMPLES
- 10-278 — 10 SERIES SAMPLES
- 500 — COPPER CONCENTRATION (mg/Kg)
- 1,000 — COPPER ISOPLETH IN mg/Kg (DASHED WHERE INFERRED)
- 500 — STACK ZONE

NOTES

1.) 2001 AND 2008 SAMPLES COLLECTED BY GOLDER; ALL OTHER SAMPLES COLLECTED BY B & C (1998).

2.) SAMPLES FROM WASTE MATERIALS (E.G. SLAG, TAILINGS) NOT USED TO DEVELOP ISOPLETHS.

3.) SURFACE SAMPLES USED TO DEVELOP ISOPLETHS.

4.) SSI = SLUDGE STORAGE IMPOUNDMENT.

REFERENCES

1.) 2008 AERIAL PHOTOGRAPH PROVIDED BY RCML.

2.) 2005 USGS DOQQ AERIAL PHOTOGRAPH OBTAINED FROM ALRIS.

1200 0 1200
SCALE 1" to 1200' FEET

PROJECT
Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

TITLE

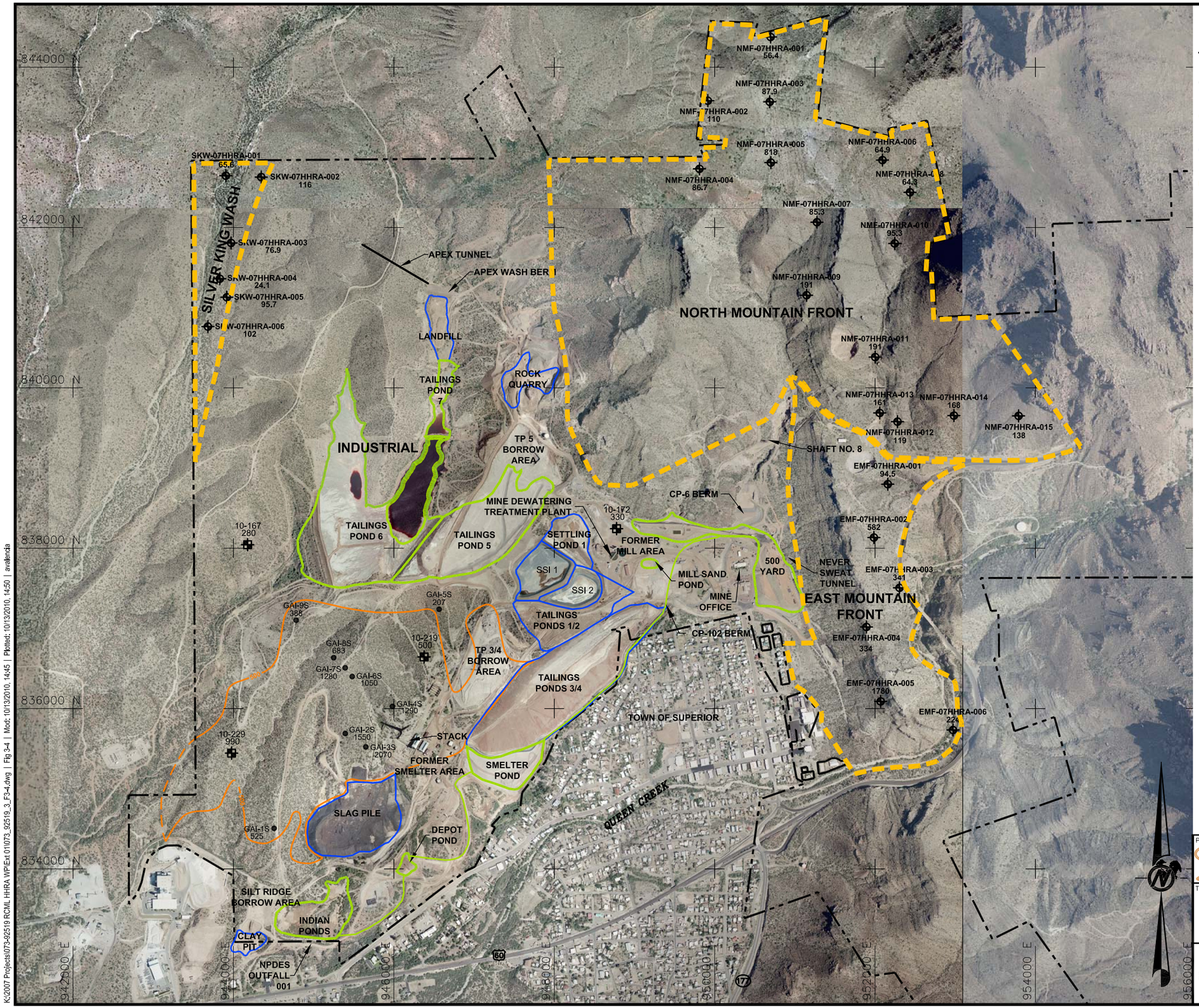
COPPER ISOPLETHS FOR SOIL

Golder Associates

PROJECT No. 073-92519-01.1			FILE No. 073_92519_5_F3-3.DWG		
DESIGN	JM	06-24-08	SCALE 1"=1200'	REV.	4
CADD	ACF	06/24/08			
CHECK	JM	06/24/08			
REVIEW	MB	06/04/08			

FIGURE 3-3

K:\2007 Projects\073-92519 RCML HHRA WP\Ext 01\073_92519_5_F3-3.dwg | Fig 3-3 | Mod: 12/29/2010, 16:36 | Plotted: 12/29/2010, 16:41 | avalencia



LEGEND

- PROPERTY LINE
- APP FACILITIES
- OTHER FACILITIES
- LAND AREA BOUNDARY
- 500 — DEFAULT CLEANUP ZONE
- NMF-07HHRA-015 / 138 — 2008 SAMPLES
- GAI-1S — 2001 SAMPLES
- 500 — LEAD CONCENTRATION (mg/Kg)
- 10-167 / 280 — 1998 SAMPLES (B&C)

NOTES

1.) 2001 AND 2008 SAMPLES COLLECTED BY GOLDER;

2.) 1998 SAMPLES COLLECTED BY B&C.

3.) SSI = SLUDGE STORAGE IMPOUNDMENT.

REFERENCES

1.) 2008 AERIAL PHOTOGRAPH PROVIDED BY RCML.

2.) 2005 USGS DOQQ AERIAL PHOTOGRAPH OBTAINED FROM ALRIS.

1200 0 1200

SCALE 1" to 1200' FEET

PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

TITLE

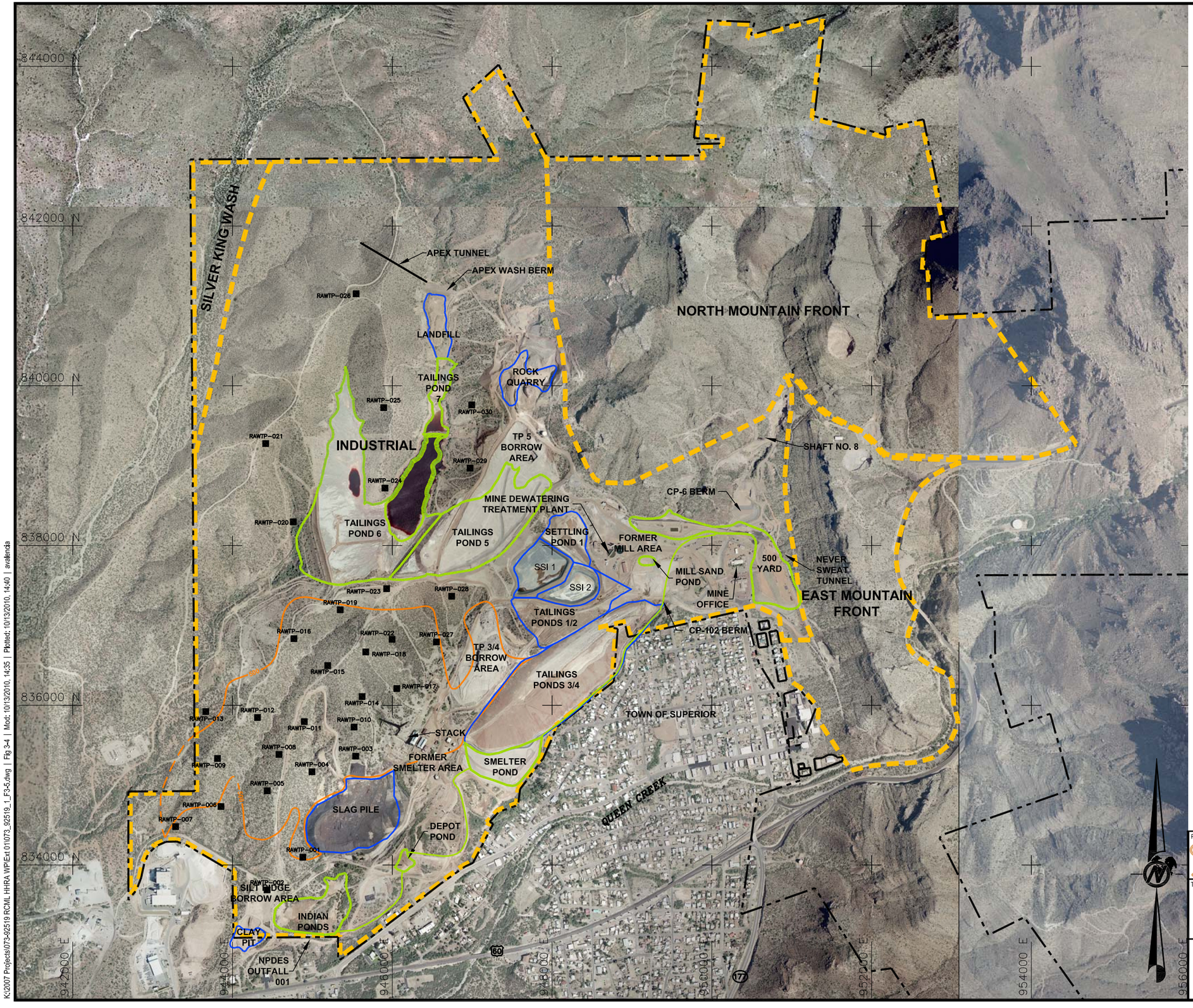
LEAD CONCENTRATIONS IN SOIL

Golder Associates

PROJECT No. 073-92519-01.1			FILE No.	073_92519_3_F3-4.DWG	
DESIGN	JM	06-24-08	SCALE	1"=1200'	REV. 2
CADD	ACF	06/24/08			
CHECK	JM	06/24/08			
REVIEW	MB	06/04/08			

FIGURE 3-4

K:\2007 Projects\073-92519 RCML HHRA WP\Ext 01\073_92519_3_F3-4.dwg | Fig 3-4 | Mod: 10/13/2010, 14:45 | Plotted: 10/13/2010, 14:50 | avallenda



LEGEND

- PROPERTY LINE
- APP FACILITIES
- OTHER FACILITIES
- LAND AREA BOUNDARY
- 500 — STACK ZONE
- SHALLOW TEST PIT LOCATIONS

NOTE

1.) SSI = SLUDGE STORAGE IMPOUNDMENT.

REFERENCES

1.) 2008 AERIAL PHOTOGRAPH PROVIDED BY RCML.

2.) 2005 USGS DOQQ AERIAL PHOTOGRAPH OBTAINED FROM ALRIS.

1200 0 1200

SCALE 1" to 1200' FEET

PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

TITLE

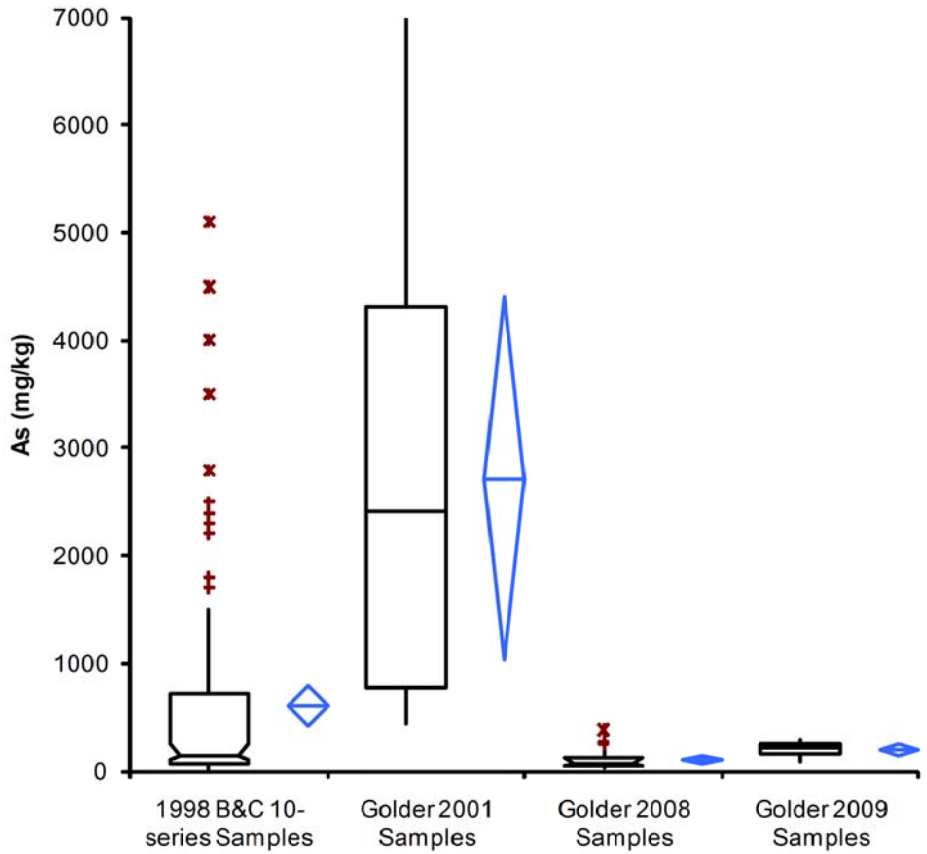
SHALLOW TEST PIT LOCATIONS APRIL 2008

Golder Associates

PROJECT No. 073-92519-01.1			FILE No.	073_92519_1_F3-5.DWG	
DESIGN	JM	06-24-08	SCALE	1"=1200'	REV. 0
CADD	ACF	06/24/08			
CHECK	JM	06/24/08			
REVIEW	MB	06/04/08			

FIGURE 3-5

K:\2007 Projects\073-92519 RCML HHRA WP\Ext 01\073_92519_1_F3-5.dwg | Fig 3-4 | Mod: 10/13/2010, 14:35 | Plotted: 10/13/2010, 14:40 | avalencia



95% CI Notched Outlier Boxplot

95% CI Mean Diamond

Outliers > 1.5 and < 3 IQR

Outliers > 3 IQR

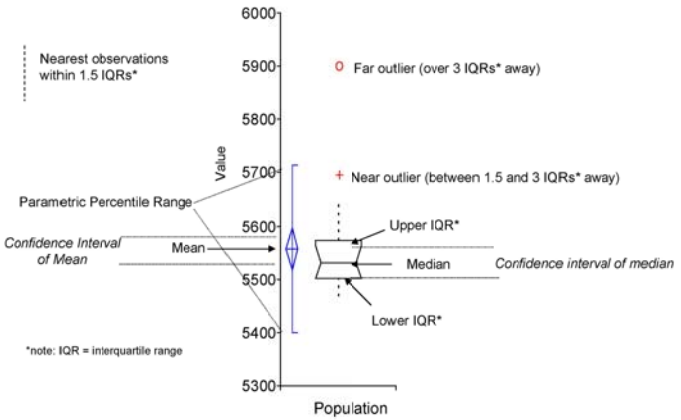
NOTES

1.) SURFACE SAMPLES ONLY.

2.) n = 123 (10–SERIES).

3.) n = 9 (GOLDER 2001)

LEGEND



PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

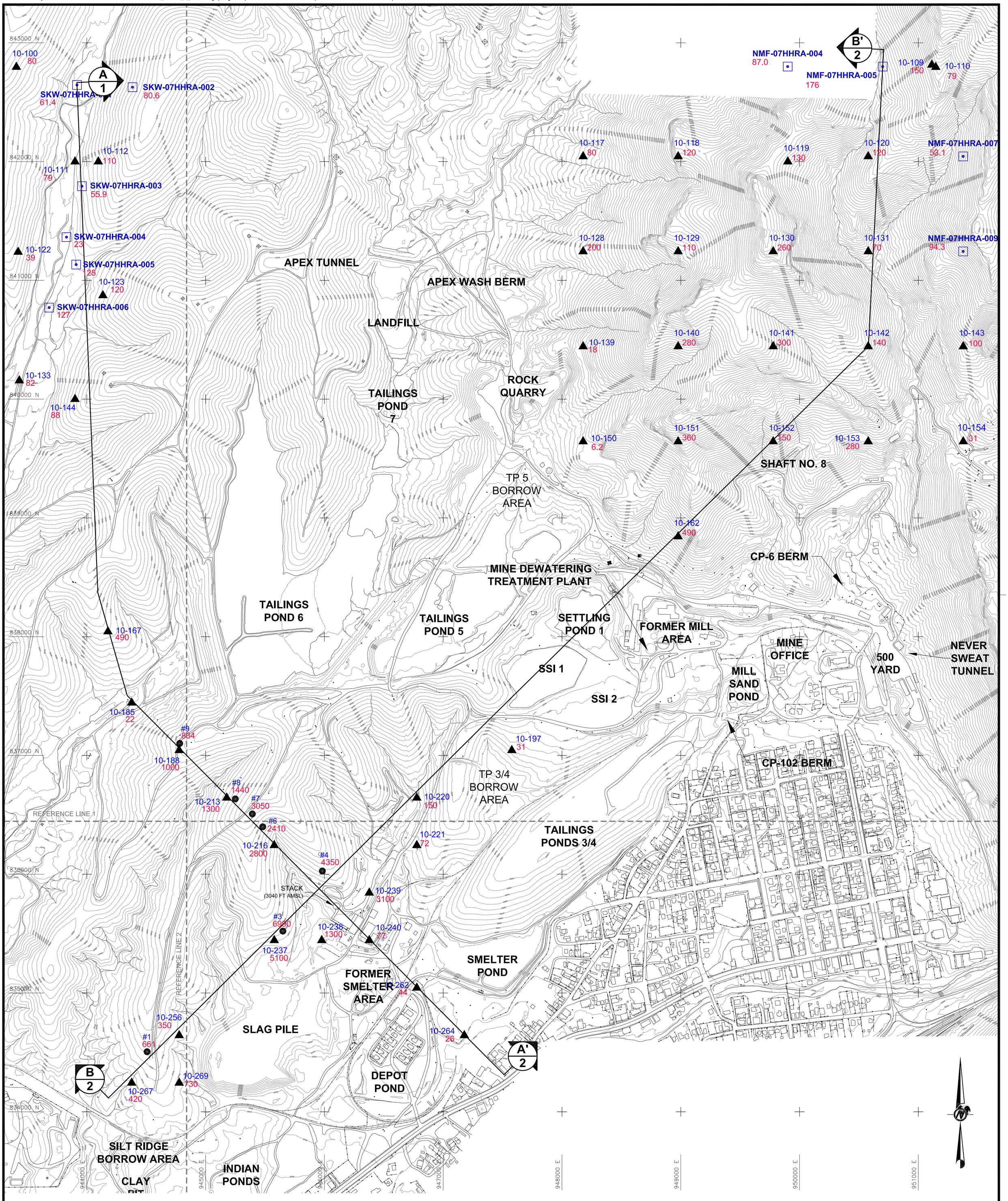
TITLE

BOX AND WHISKER PLOTS OF EXISTING B&C AND GOLDER DATA

Golder Associates

PROJECT No. 073–92519–01.1			FILE No. 073_92519_3_F4–1.DWG	
DESIGN	JM	06–24–08	SCALE NA	REV. 2
CADD	ACF	06/24/08		
CHECK	JM	06/24/08		
REVIEW	MB	06/04/08		

FIGURE 4-1



LEGEND

⊡	VSP SAMPLE LOCATION
●	GOLDER 2001 SAMPLES
▲	B&C 1998 10 SERIES SAMPLES
10-267	SAMPLE ID
500	ARSENIC CONCENTRATION (mg/Kg)
SSI	SLUDGE STORAGE IMPOUNDMENT

REFERENCES

1.) 2004 TOPOGRAPHIC BASE MAP PROVIDED BY DARLING SURVEY AND ENVIRONMENTAL. CONTOUR INTERVAL IS 10 FT.

400 0 400
SCALE : 1" to 400' FEET

PROJECT
Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

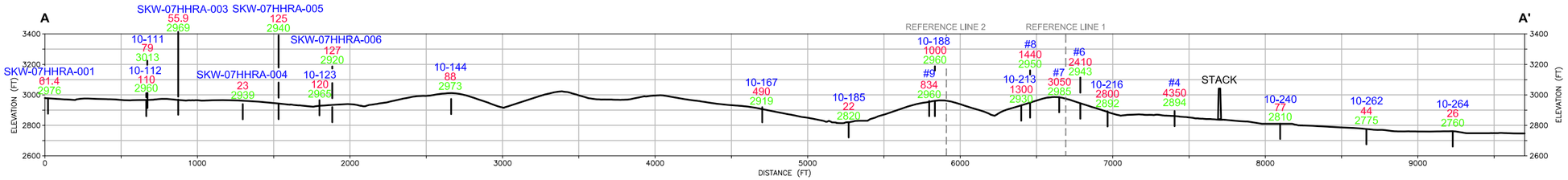
TITLE

VARIABILITY OF ARSENIC CONCENTRATIONS WITH TOPOGRAPHY AND WIND DIRECTION (PLAN VIEW)

Golder Associates

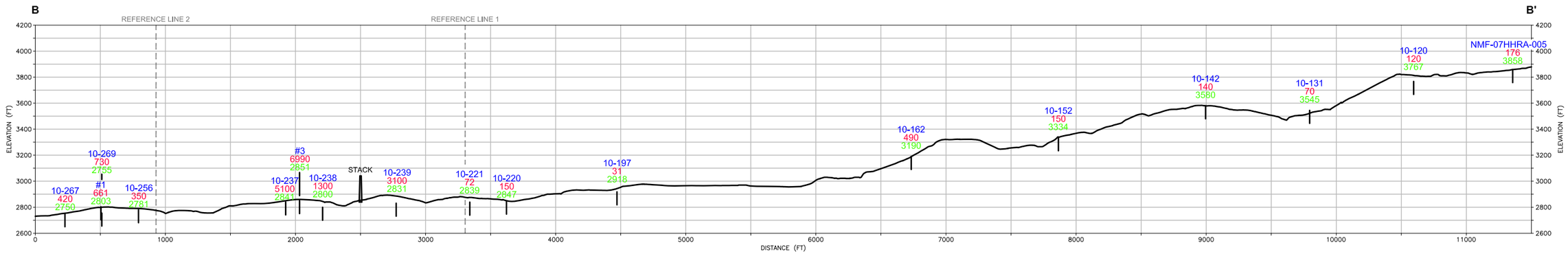
PROJECT No. 073-92519-01.1			FILE No.	073_92519_3_F4-2.DWG	
DESIGN	JM	06-24-08	SCALE	1"=800'	REV. 2
CADD	ACF	06/24/08			
CHECK	JM	06/24/08			
REVIEW	MB	06/04/08			

FIGURE 4-2



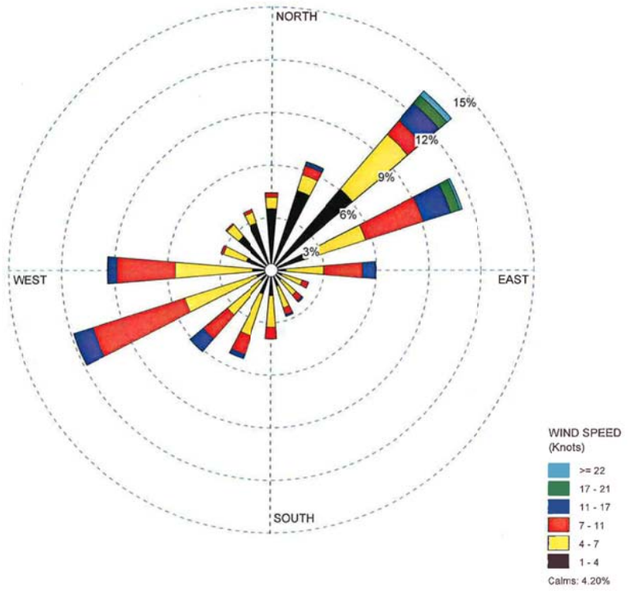
A/4 CROSS-SECTION A-A'

SCALE B: 1" to 400' FEET (400 0 400)



B/4 CROSS-SECTION B-B'

SCALE B: 1" to 400' FEET (400 0 400)



COMPREHENSIVE WIND ROSE FOR WEST PLANT SITE, AUGUST 2002 THROUGH JULY 2003

WEST PLANT SITE AIRMET STATION LOCATED
APPROXIMATELY: N 837469, E 948947

LEGEND

10-267	SAMPLE ID
500	ARSENIC CONCENTRATION (mg/Kg)
2820	PROJECTED SAMPLE ELEVATION (ft amsl) (TOP OF BAR INDICATES GROUND SURFACE)

PROJECT: Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

TITLE

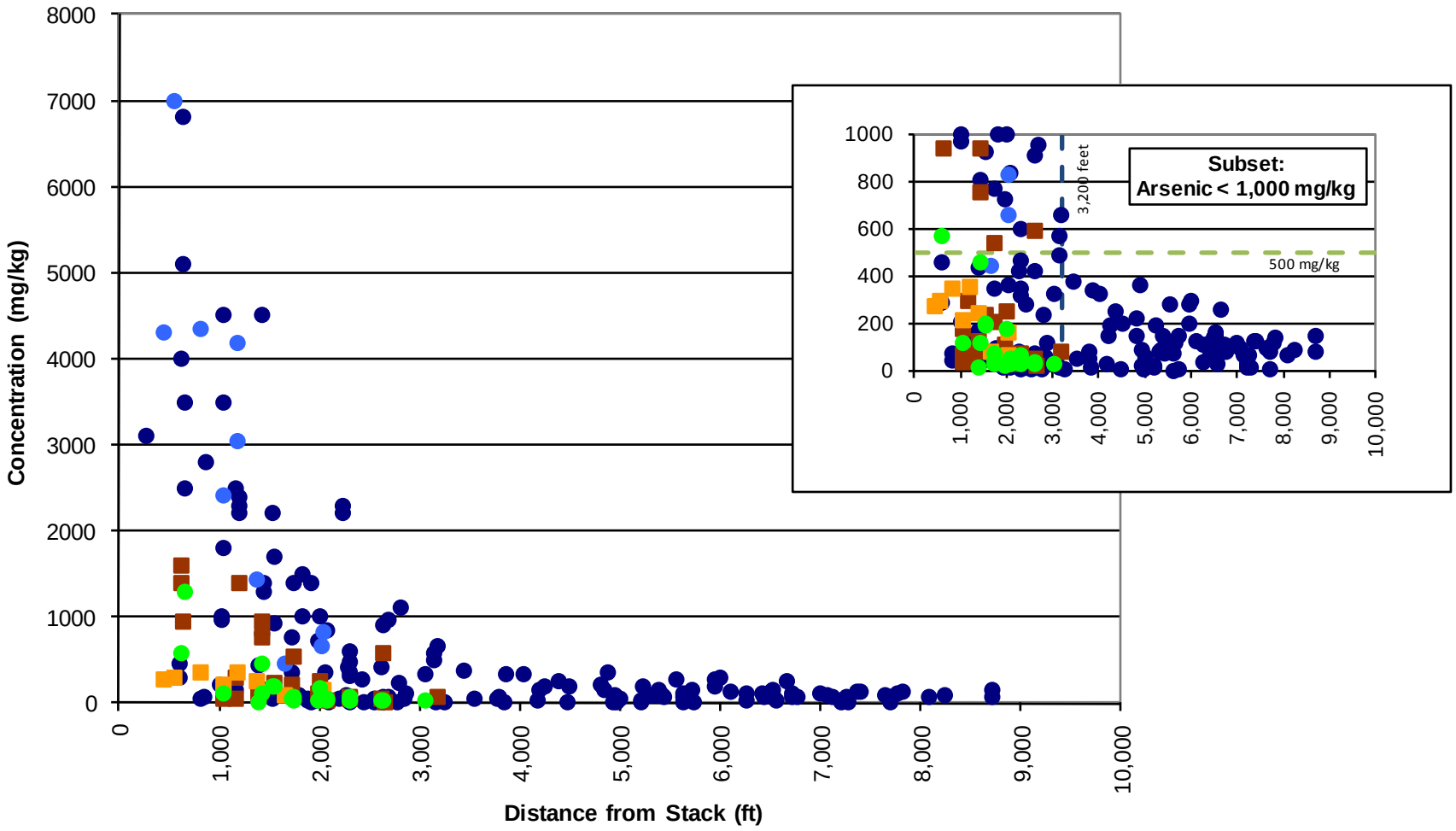
VARIABILITY OF ARSENIC CONCENTRATIONS WITH TOPOGRAPHY AND WIND DIRECTION (CROSS-SECTIONS)

Golder Associates

PROJECT No.	073-92519.2		FILE No.	073_92519_2_F4-3.DWG
DESIGN	JM	06-24-08	SCALE	AS-SHOWN REV. 1
CADD	ACF	06/24/08		
CHECK	JM	06/24/08		
REVIEW	MB	06/04/08		

FIGURE 4-3

Drawing file: 073925190205.dwg Jun 27, 2008 - 10:48am



- Surface Samples - B&C
- Intermediate Samples - B&C
- Deep Samples - B&C
- Surface Samples - GAI
- Intermediate Samples - GAI

PROJECT
Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

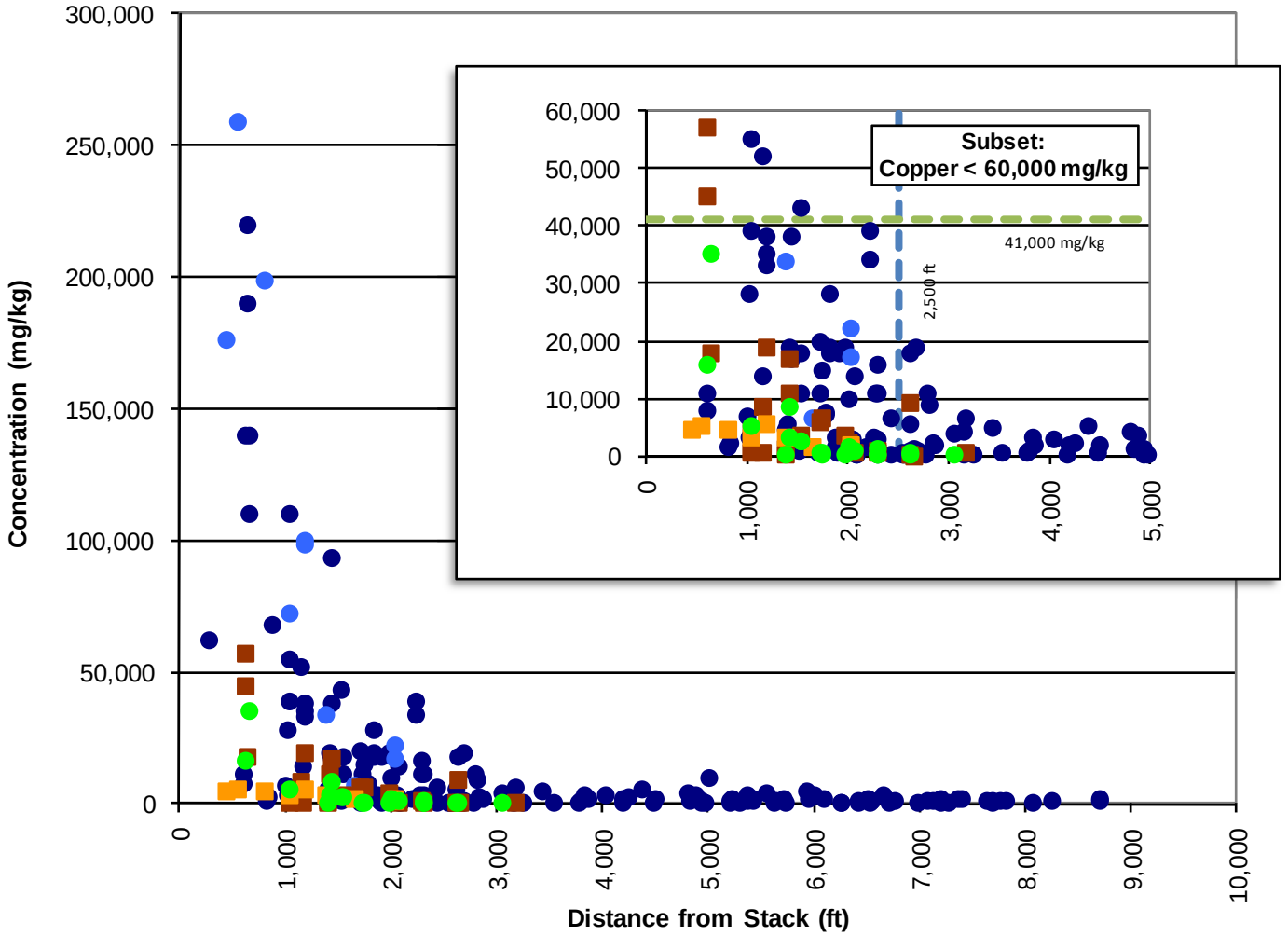
TITLE

VARIATION OF ARSENIC CONCENTRATION IN SOIL WITH DISTANCE FROM STACK

Golder Associates

PROJECT No.	07392519-01.1		FILE No.	07392519011fig4-4.ai	
DESIGN	JM	06-24-08	SCALE	NA	REV. 1
CADD	AMP	10-06-10			
CHECK	JM	06-24-08			
REVIEW	MB	06-24-08			

FIGURE 4-4



- Surface Samples - B&C
- Surface Samples - GAI
- Intermediate Samples - B&C
- Deep Samples - B&C
- Intermediate Samples - GAI

PROJECT
Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

TITLE

VARIATION OF COPPER CONCENTRATION IN SOIL WITH DISTANCE FROM STACK

Golder Associates

PROJECT No.	07392519-01.1		FILE No.	07392519011fig4-5_R1.ai
DESIGN	JM	06-24-08	SCALE	NA REV. 1
CADD	AMP	01-06-11		
CHECK	JM	06-24-08		
REVIEW	MB	06-24-08		

FIGURE 4-5

PROJECT
Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

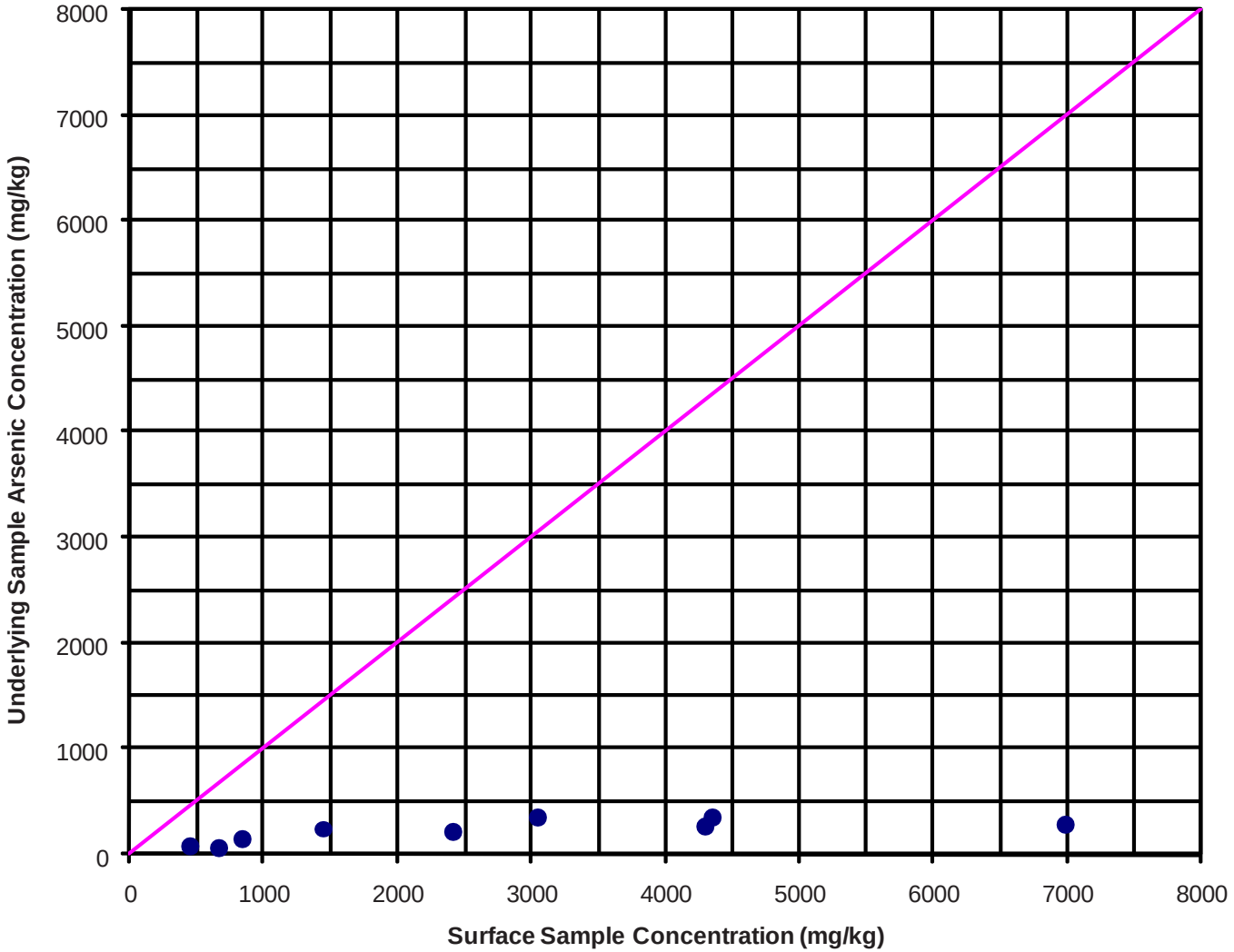
TITLE

PHOTOGRAPHS OF GRAY LAYER

Golder Associates

PROJECT No. 073-92519-01.1			FILE No. 073_92519_3_F4-6.DWG	
DESIGN	KJ	06/24/08	SCALE SHOWN	REV. 2
CADD	ACF	06/24/08		
CHECK	KJ	06/24/08		
REVIEW	DC	06/24/08		

FIGURE 4-6



NOTES

1) Soil Samples from October 2001 Sampling Event.

2) Concentrations are for <250 UM Size Fraction.

PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

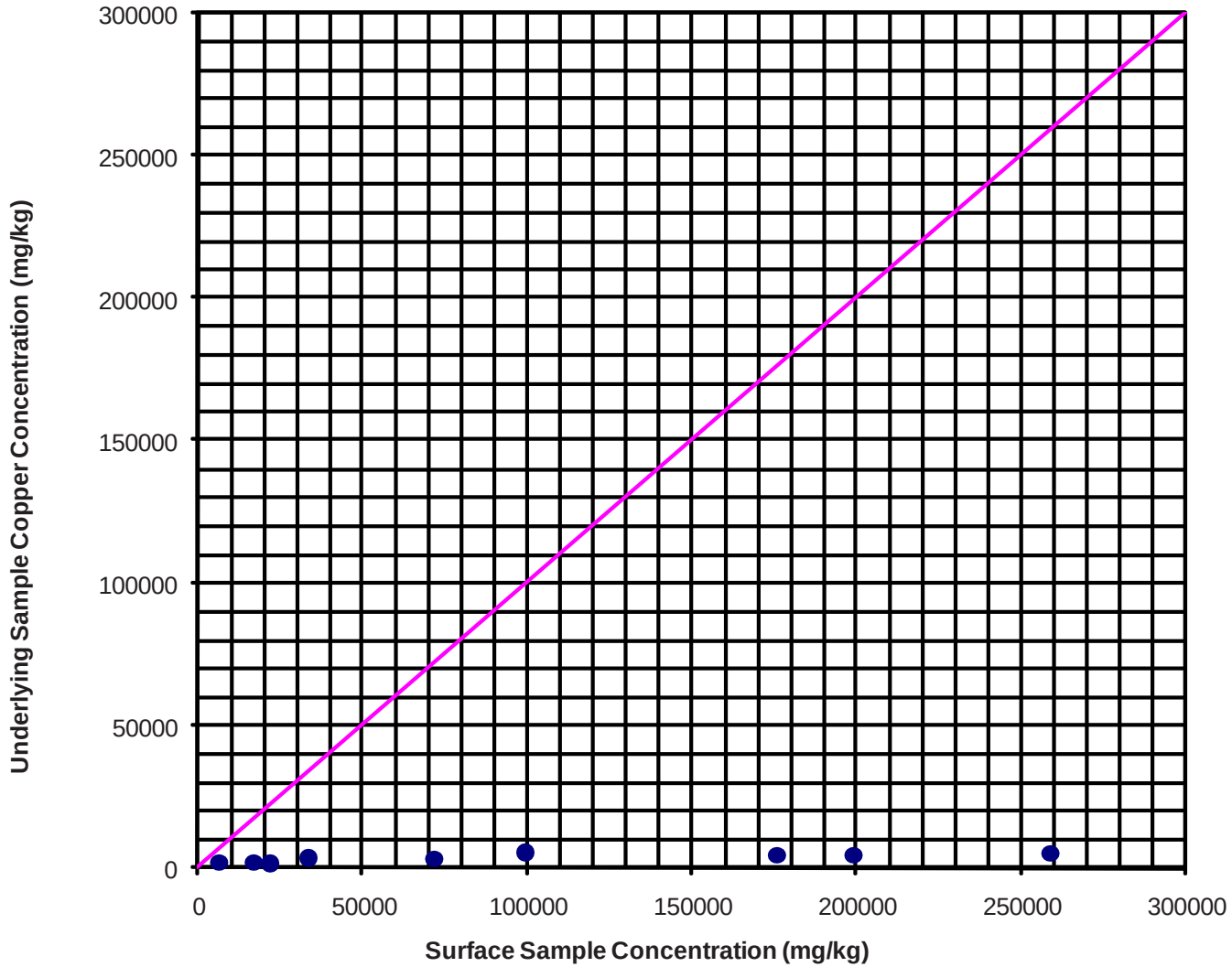
TITLE

CROSS PLOT OF ARSENIC IN THE GRAY AND UNDERLYING LAYERS

Golder Associates

PROJECT No.	07392519-01.1		FILE No.	07392519011fig4-7.ai	
DESIGN	JM	06-24-08	SCALE	NA	REV. 1
CADD	AMP	10-06-10			
CHECK	JM	06-24-08			
REVIEW	MB	06-24-08			

FIGURE 4-7



NOTES

1) Soil Samples from October 2001 Sampling Event.

2) Concentrations are for <250 UM Size Fraction.

PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

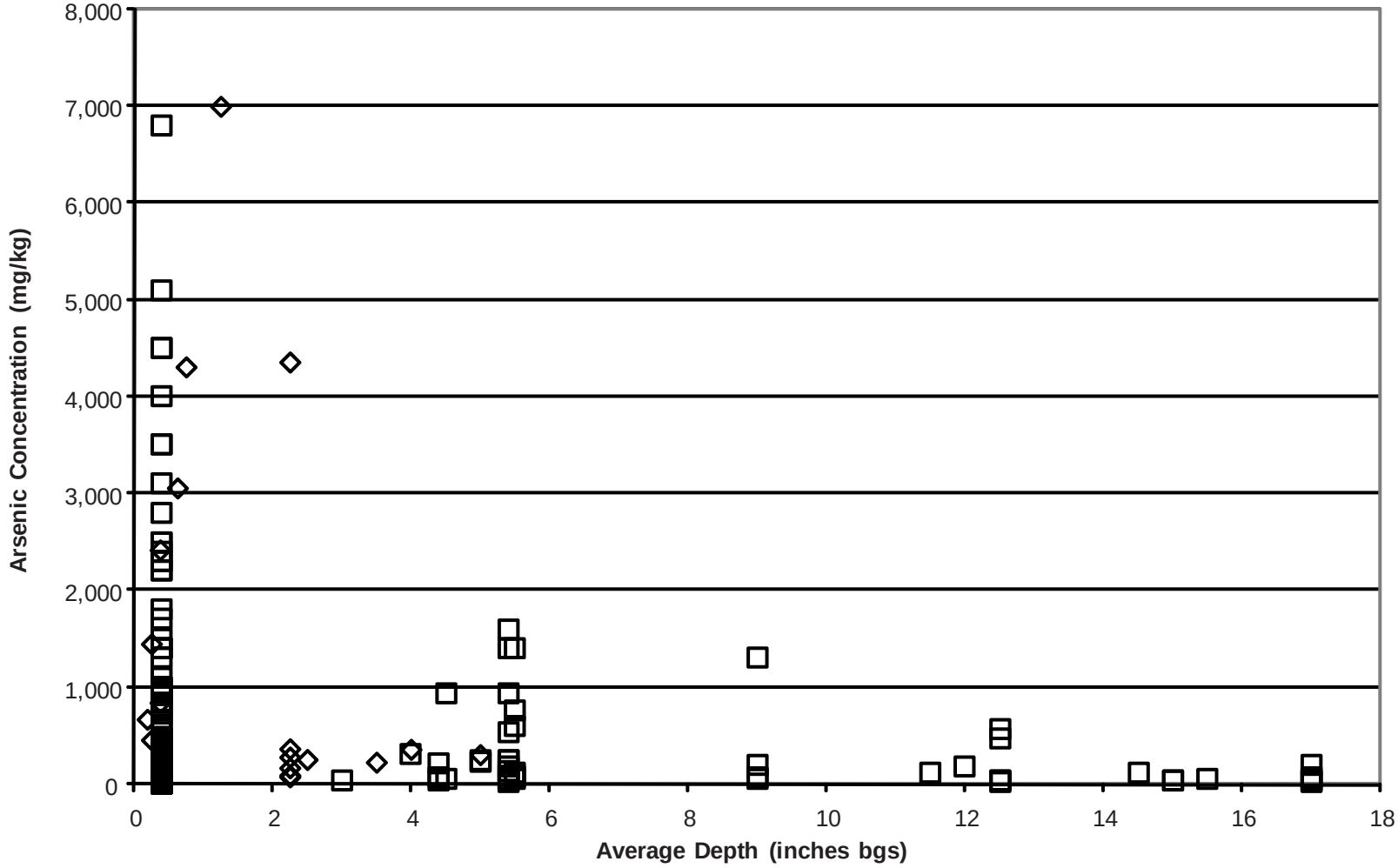
TITLE

CROSS PLOT OF COPPER IN THE GRAY AND UNDERLYING LAYERS

Golder Associates

PROJECT No.		07392519-01.1	FILE No.		07392519011fig4-8.ai
DESIGN	JM	06-24-08	SCALE	NA	REV. 1
CADD	AMP	10-06-10			
CHECK	JM	06-24-08			
REVIEW	MB	06-24-08			

FIGURE 4-8



B&C 10 -Series Data

October 2001 Samples

PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

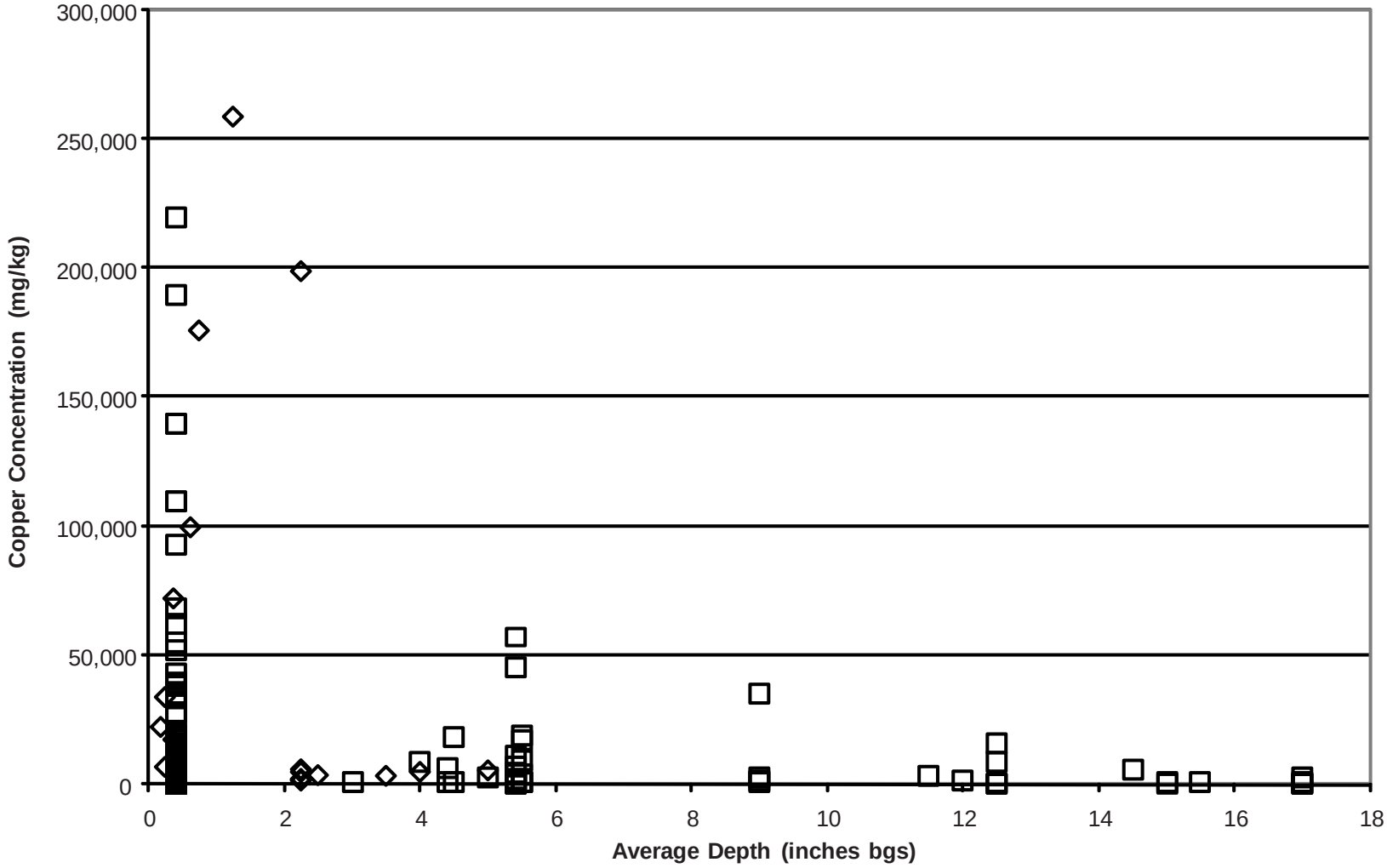
TITLE

VARIATION OF ARSENIC CONCENTRATION IN SOIL WITH DEPTH

Golder Associates

PROJECT No.	07392519-01.1		FILE No.	07392519011fig4-9.ai	
DESIGN	JM	06-24-08	SCALE	NA	REV. 1
CADD	AMP	10-06-10			
CHECK	JM	06-24-08			
REVIEW	MB	06-24-08			

FIGURE 4-9



PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

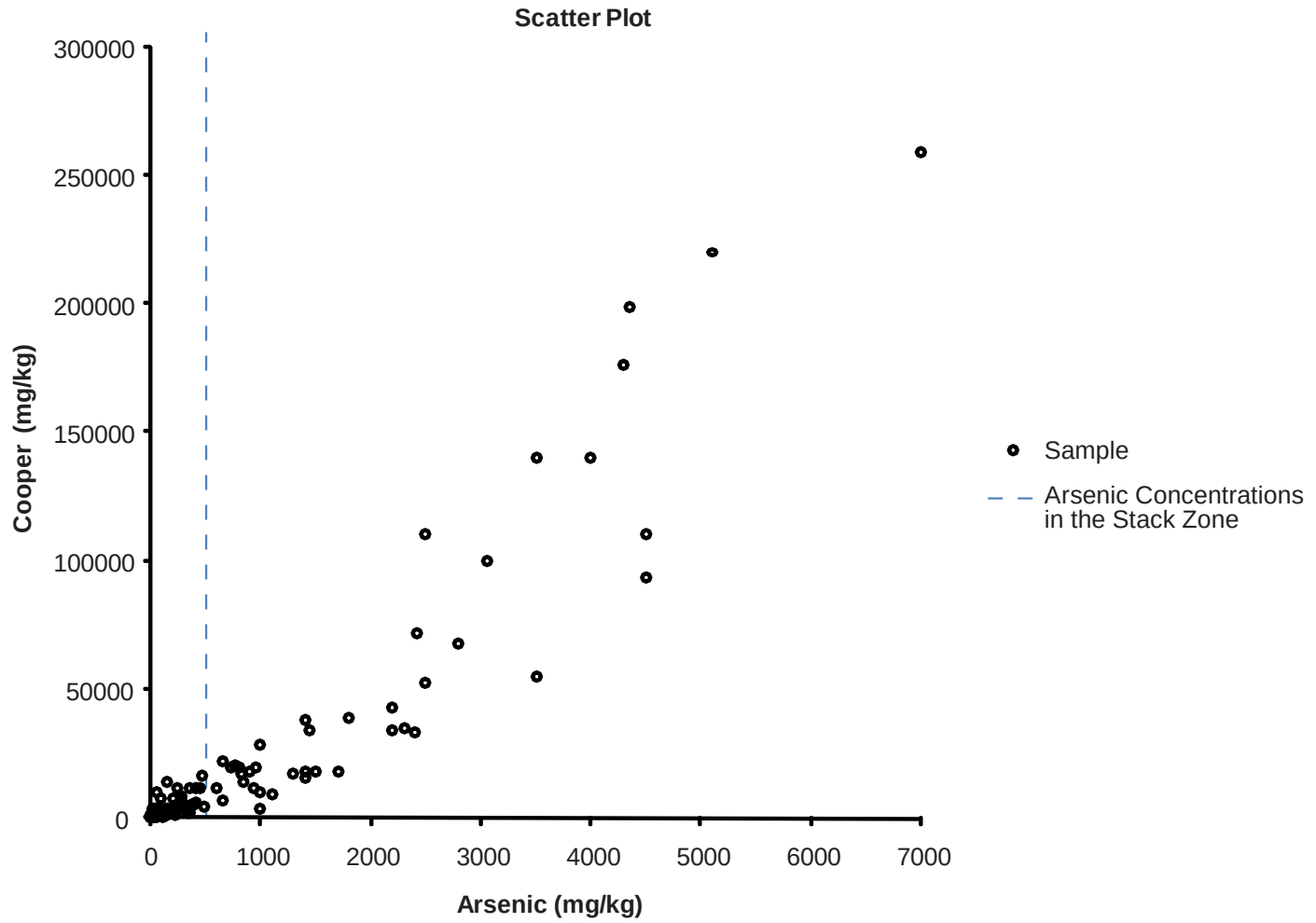
TITLE

VARIATION OF COPPER CONCENTRATION IN SOIL WITH DEPTH

Golder Associates

PROJECT No.	07392519-01.1		FILE No.	
DESIGN	JM	06-24-08	SCALE NA	REV. 1
CADD	AMP	10-06-10		
CHECK	JM	06-24-08		
REVIEW	MB	06-24-08		

FIGURE 4-10



Test	**Correlation - Spearman**		
	As (mg/kg) v Cu (mg/kg). rs ¹ 0		
Performed by	omorfin	Date	6 May 2008

n	169	
rs statistic	0.89	
95% CI	0.86 to 0.92	(normal approximation)
t statistic	25.62	
DF	167	
2-tailed p	<0.0001	(t approximation, corrected for ties)

rs statistic = Spearman correlation coefficient (rho)
95% CI = 95% confidence interval
DF = degrees of freedom

PROJECT
Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

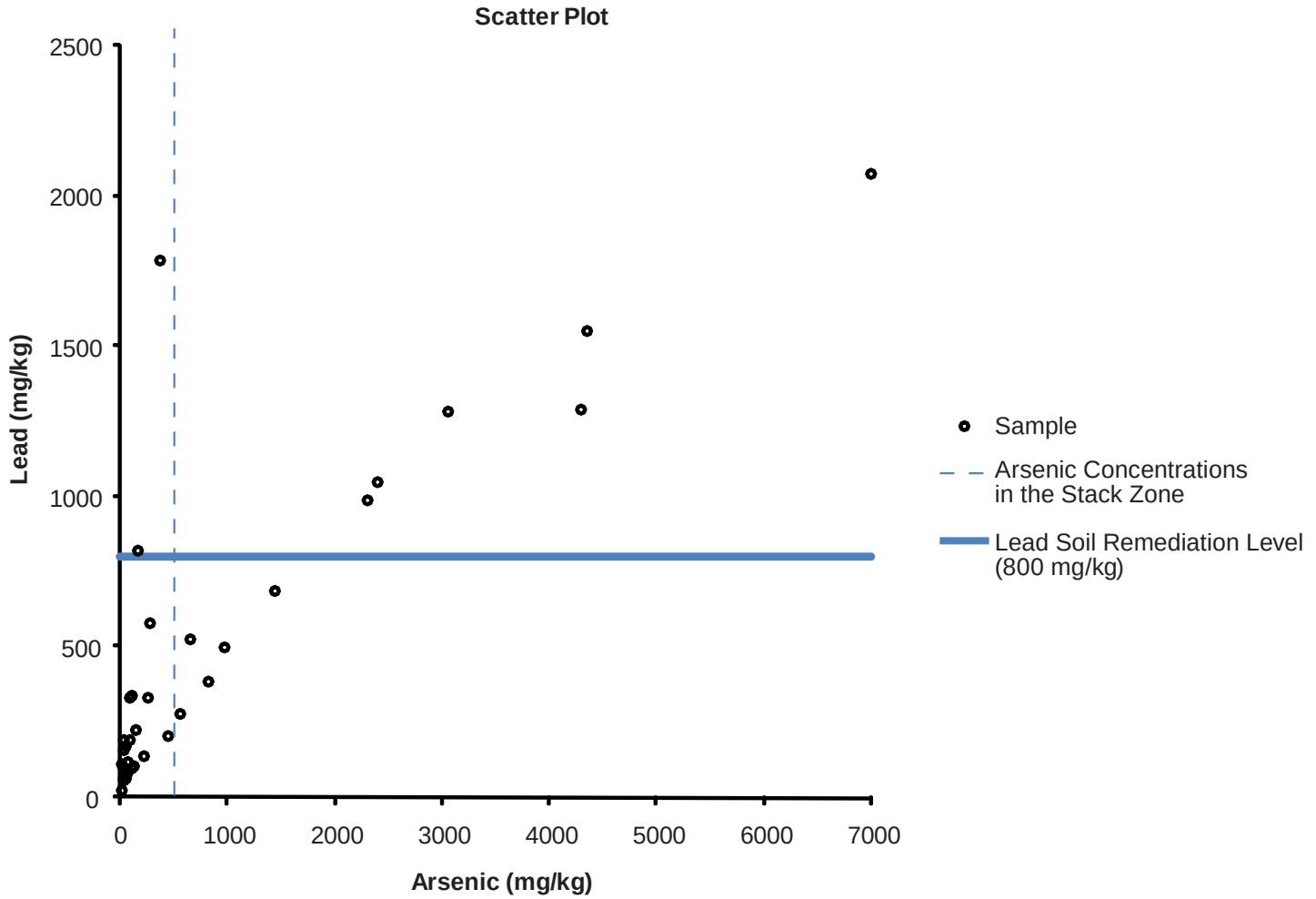
TITLE

SPEARMAN CORRELATIONS OF ARSENIC AND COPPER (ALL DATA SETS)

Golder Associates

PROJECT No.	07392519-01.1		FILE No.	07392519011fig4-11.ai
DESIGN	JM	06-24-08	SCALE	NA REV. 1
CADD	AMP	06-24-08		
CHECK	JM	06-24-08		
REVIEW	MB	06-24-08		

FIGURE 4-11



Test	**Correlation - Spearman**		
	As (mg/kg) v Pb (mg/kg). rs ¹ 0		
Performed by	omorfin	Date	26 June 2008

n	40	
rs statistic	0.85	
95% CI	0.74 to 0.92	(normal approximation)
t statistic	10.13	
DF	38	
2-tailed p	<0.0001	(t approximation, corrected for ties)

rs statistic = Spearman correlation coefficient (rho)
95% CI = 95% confidence interval
DF = degrees of freedom

PROJECT
Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

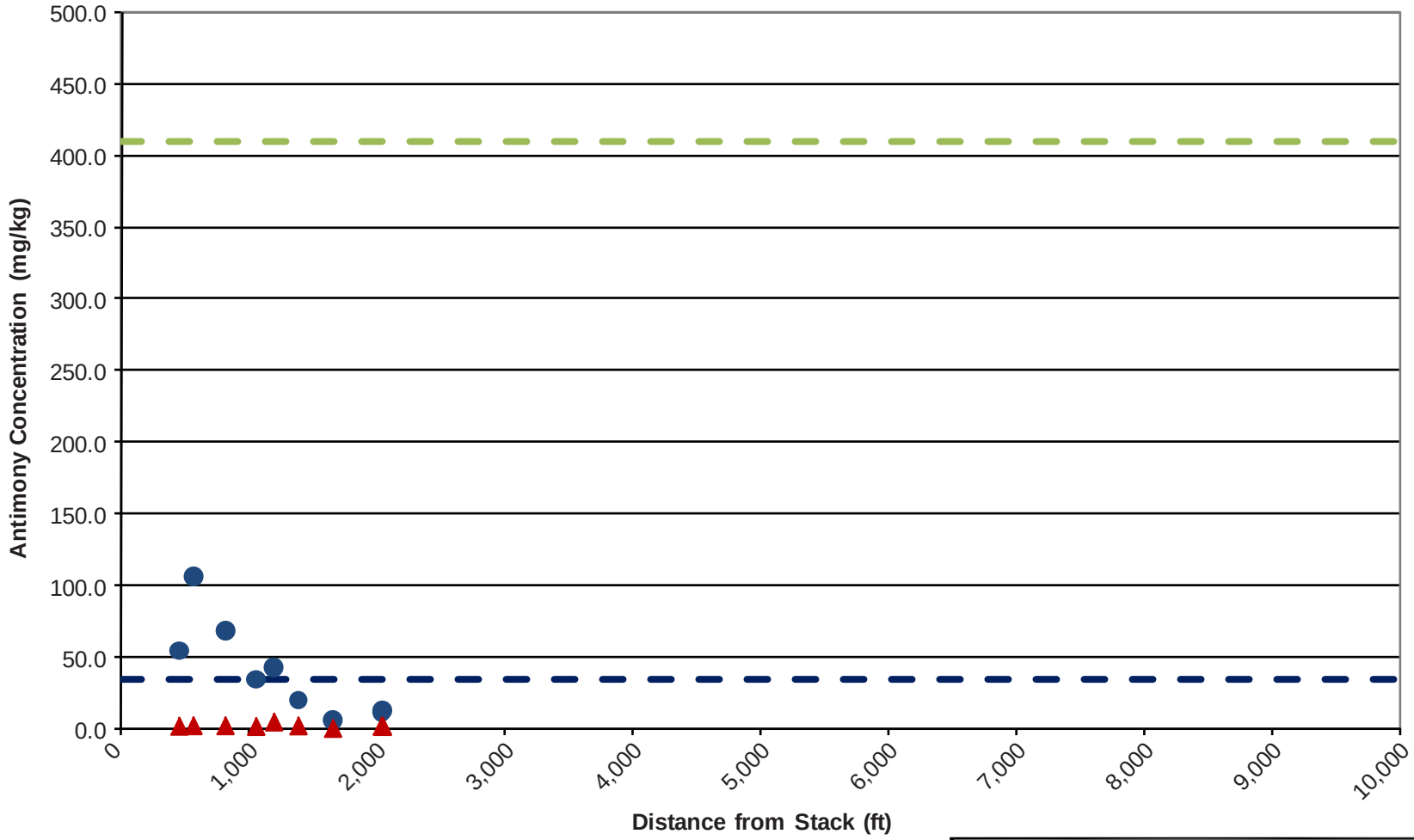
TITLE

SPEARMAN CORRELATIONS OF ARSENIC AND LEAD (GOLDER 2001 AND 2008 DATA SETS)

Golder Associates

PROJECT No.	07392519-01.1		FILE No.	07392519011fig4-12.ai
DESIGN	JM	06-24-08	SCALE	NA REV. 1
CADD	AMP	10-06-10		
CHECK	JM	06-24-08		
REVIEW	MB	06-24-08		

FIGURE 4-12



PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

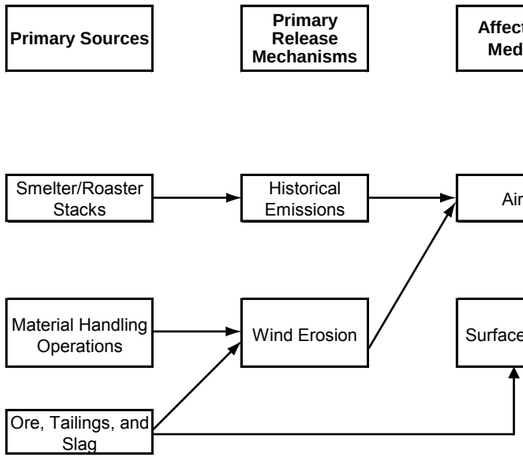
TITLE

VARIATION OF ANTIMONY CONCENTRATION IN SOIL WITH DISTANCE FROM STACK

Golder Associates

PROJECT No.	07392519-01.1		FILE No.	07392519011fig4-13.ai	
DESIGN	JM	06-24-08	SCALE	NA	REV. 1
CADD	AMP	10-06-10			
CHECK	JM	06-24-08			
REVIEW	MB	06-24-08			

FIGURE 4-13



Receptors									
Pathway	Exposure Route	East Mountain Front		Industrial Area		North Mountain Front		Silver King Wash	
	Exposure Scenario	Trespassers	Industrial Workers	Trespassers	Industrial Workers	Rugged Terrain Trespassers	Industrial Workers	Trespassers	Industrial Workers
	Frequency of Use	Low-Level	Low-Level	Low-Level	Workshift	Infrequent	Infrequent	Low-Level	Low-Level
Soil	Ingestion	●	●	●	●	●	●	●	●
Soil	Dermal Contact	●	●	●	●	●	●	●	●
Wind	Inhalation	●	●	●	●	●	●	●	●

Receptors by Land Use Area								
Age Groups	East Mt. Front		Industrial Area		North Mt. Front		Silver King Wash	
	Trespassers	Industrial Workers	Trespassers	Industrial Workers	Rugged Terrain Trespassers	Industrial Workers	Trespassers	Industrial Workers
Preteens (6-13 years)	○	○	○	○	○	○	●	○
Teens (13-18 years)	●	○	●	○	●	○	○	○
Adults (> 18 years)	●	●	●	●	●	●	●	●

LEGEND

●	Receptor evaluated in the Risk Evaluation
○	Receptor not evaluated in the Risk Evaluation because a younger age group is evaluated

PROJECT
Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

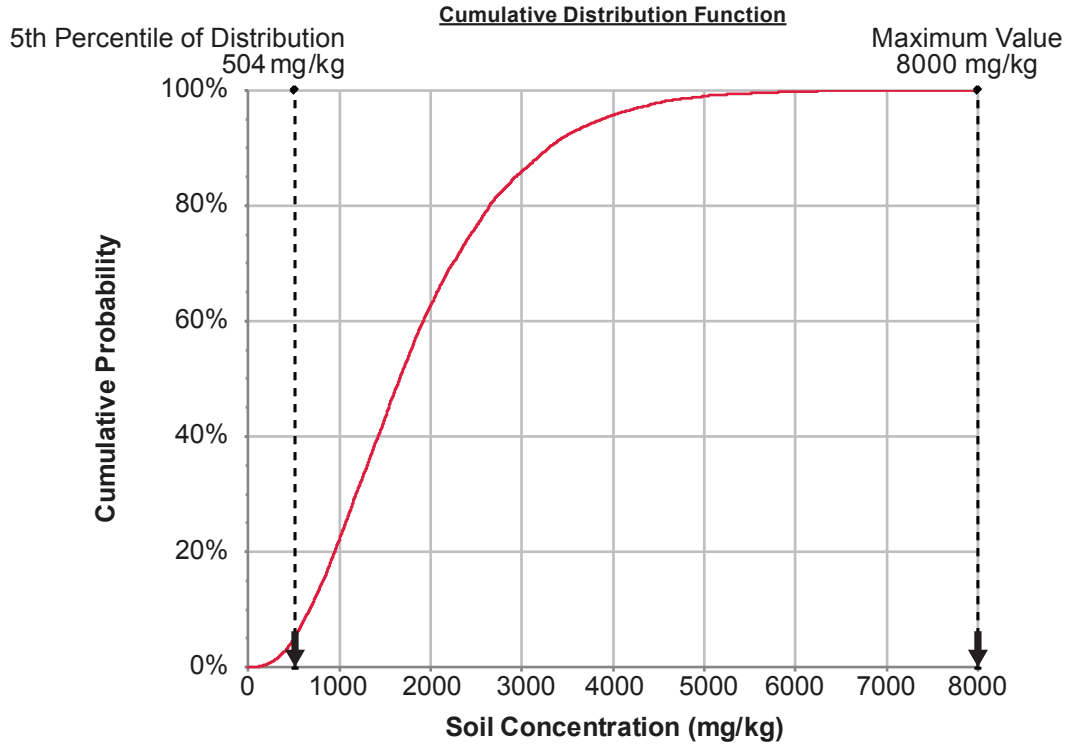
TITLE

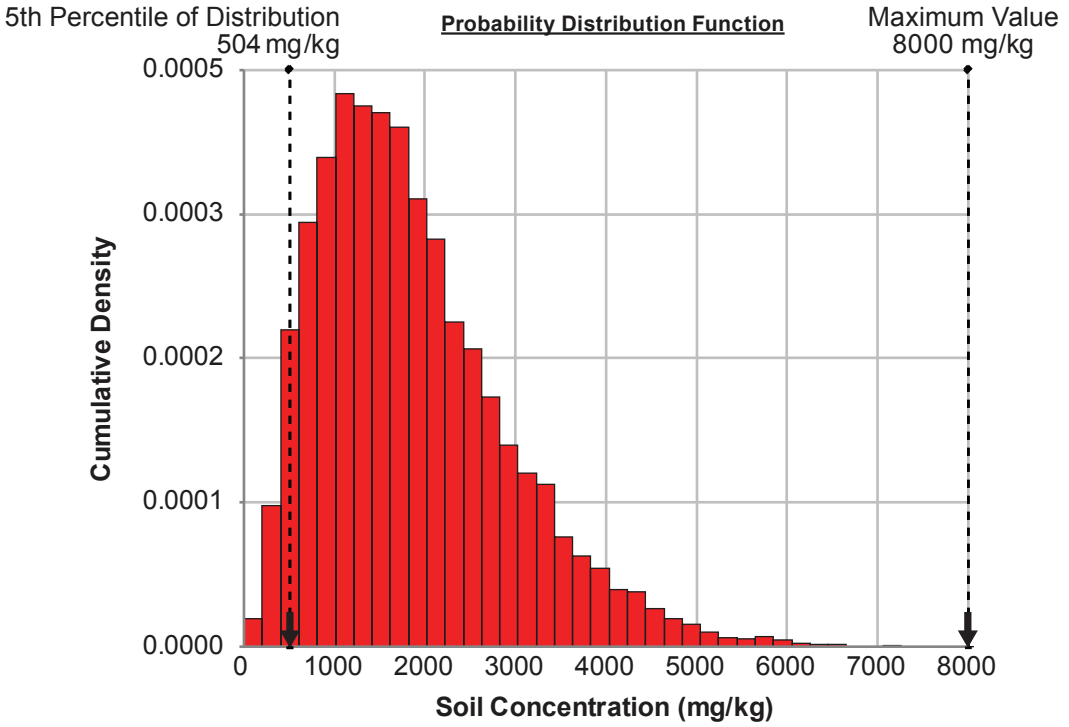
CONCEPTUAL SITE MODEL FOR SOIL WEST PLANT SITE

Golder Associates

PROJECT No.		07392519-01.1	FILE No.	07392519011fig5-1_R2.ai
DESIGN	JM	06-24-08	SCALE	NA REV. 1
CADD	AMP	10-06-10		
CHECK	JM	06-24-08		
REVIEW	MB	06-24-08		

FIGURE 5-1





PROJECT

Resolution Copper Mining

SITE CHARACTERIZATION REPORT
WEST PLANT SITE,
SUPERIOR, ARIZONA

TITLE

HYPOTHETICAL SOIL CONCENTRATION DISTRIBUTION FOR COMPOUND 'Y' AS BOTH A CUMULATIVE DISTRIBUTION AND PROBABILITY DISTRIBUTION FUNCTION

Golder Associates

PROJECT No.		07392519-01.1	FILE No. 07392519011fig6-1_R1.ai	
DESIGN	JC	10-15-10	SCALE NA	REV. 1
CADD	AMP	12-21-10		
CHECK	JC	10-19-10		
REVIEW	DC	10/20/10		

FIGURE 6-1

APPENDIX A
SMELTER AFFECTED SOIL CHARACTERIZATION
ON CD

Appendix A1
Brown and Caldwell 1998 10-Series Data Packages

Table 2.4 Summary of Surface Soil Data from Baseline Survey
Table 2.5 Summary of Multi-Analyte Data from Baseline Survey
Table 2.6 Summary of Data from Locations with Subsurface Soil Samples

Table 2.4
Summary of Surface Soil Data from Baseline Survey

Sample ID	Location	Sample Type	Arsenic	Copper
10-100-JDSL	10-100	Reg	80	1000
10-101-JDSL	10-101	Reg	9	150
10-102-JDSL	10-102	Reg	15	1600
10-103-JDSL	10-103	Reg	31	430
10-104-JDSL	10-104	Reg	70	560
10-105-JDSL	10-105	Reg	15	200
10-106-JDSL	10-106	Reg	130	2000
10-107-JDSL	10-107	Reg	140	1100
10-108-BDSL	10-108	Dup	66	720
10-108-JDSL	10-108	Reg	65	700
10-109-JDSL	10-109	Reg	150	1800
10-110-JDSL	10-110	Reg	79	780
10-111-JDSL	10-111	Reg	79	880
10-112-JDSL	10-112	Reg	110	1000
10-113-JDSL	10-113	Reg	100	1400
10-114-JDSL	10-114	Reg	68	790
10-115-JDSL	10-115	Reg	120	610
10-116-BDSL	10-116	Dup	150	550
10-116-JDSL	10-116	Reg	160	650
10-117-JDSL	10-117	Reg	80	660
10-118-JDSL	10-118	Reg	120	400
10-119-JDSL	10-119	Reg	130	1600
10-120-JDSL	10-120	Reg	120	920
10-121-JDSL	10-121	Reg	90	1100
10-122-JDSL	10-122	Reg	39	580
10-123-JDSL	10-123	Reg	120	1100
10-124-BDSL	10-124	Dup	91	970
10-124-JDSL	10-124	Reg	88	920
10-125-JDSL	10-125	Reg	76	820
10-126-JDSL	10-126	Reg	1.8	230
10-127-JDSL	10-127	Reg	4.1	84
10-128-JDSL	10-128	Reg	200	1500
10-129-JDSL	10-129	Reg	110	590
10-130-JDSL	10-130	Reg	260	3100
10-131-JDSL	10-131	Reg	70	800
10-132-JDSL	10-132	Reg	100	1200
10-133-JDSL	10-133	Reg	82	550
10-134-JDSL	10-134	Reg	190	1900
10-135-JDSL	10-135	Reg	9.5	100
10-136-JDSL	10-136	Reg	150	1300
10-137-JDSL	10-137	Reg	160	5900
10-138-JDSL	10-138	Reg	20	75
10-139-JDSL	10-139	Reg	18	120
10-140-JDSL	10-140	Reg	280	3700
10-141-JDSL	10-141	Reg	300	3400
10-142-JDSL	10-142	Reg	140	2100
10-143-BDSL	10-143	Dup	100	1100
10-143-JDSL	10-143	Reg	95	1100
10-144-BDSL	10-144	Dup	89	1200
10-144-JDSL	10-144	Reg	88	1100

All results in mg/kg
Reg - regular sample
Dup - duplicate sample

Table 2.4
Summary of Surface Soil Data from Baseline Survey

Sample ID	Location	Sample Type	Arsenic	Copper
10-145-JDSL	10-145	Reg	200	1800
10-146-JDSL	10-146	Reg	150	1900
10-147-JDSL	10-147	Reg	330	3000
10-148-JDSL	10-148	Reg	14	1500
10-149-JDSL	10-149	Reg	29	310
10-150-BDSL	10-150	Dup	5.9	570
10-150-JDSL	10-150	Reg	6.2	540
10-151-JDSL	10-151	Reg	360	3600
10-152-BDSL	10-152	Dup	150	3000
10-152-JDSL	10-152	Reg	150	2900
10-153-JDSL	10-153	Reg	280	4400
10-154-JDSL	10-154	Reg	31	780
10-155-JDSL	10-155	Reg	340	1900
10-156-JDSL	10-156	Reg	81	960
10-157-JDSL	10-157	Reg	380	4900
10-158-JDSL	10-158	Reg	9.8	200
10-159-JDSL	10-159	Reg	9.5	360
10-160-JDSL	10-160	Reg	190	810
10-161-JDSL	10-161	Reg	49	510
10-162-JDSL	10-162	Reg	190	2200
10-163-JDSL	10-163	Reg	220	4300
10-164-JDSL	10-164	Reg	78	1300
10-165-JDSL	10-165	Reg	130	1500
10-166-JDSL	10-166	Reg	51	500
10-167-JDSL	10-167	Reg	490	4200
10-168-BDSL	10-168	Dup	23	2000
10-168-JDSL	10-168	Reg	20	1900
10-170-JDSL	10-170	Reg	27	460
10-171-JDSL	10-171	Reg	15	57
10-172-BDSL	10-172	Dup	94	68000
10-172-JDSL	10-172	Reg	86	68000
10-173-JDSL	10-173	Reg	41	12000
10-174-JDSL	10-174	Reg	28	8600
10-175-JDSL	10-175	Reg	45	3700
10-176-JDSL	10-176	Reg	40	2300
10-177-JDSL	10-177	Reg	40	3400
10-178-JDSL	10-178	Reg	100	2700
10-179-JDSL	10-179	Reg	250	5200
10-180-JDSL	10-180	Reg	56	10000
10-181-JDSL	10-181	Reg	150	1800
10-182-JDSL	10-182	Reg	330	4000
10-183-JDSL	10-183	Reg	120	1900
10-184-JDSL	10-184	Reg	20	330
10-185-JDSL	10-185	Reg	22	360
10-186-JDSL	10-186	Reg	8.6	290
10-187-JDSL	10-187	Reg	320	3000
10-188-JDSL	10-188	Reg	1000	10000
10-189-JDSL	10-189	Reg	28	360
10-190-JDSL	10-190	Reg	12	770
10-191-JDSL	10-191	Reg	930	11000

All results in mg/kg
Reg - regular sample
Dup - duplicate sample

Table 2.4
Summary of Surface Soil Data from Baseline Survey

Sample ID	Location	Sample Type	Arsenic	Copper
10-192-JDSL	10-192	Reg	810	19000
10-193-JDSL	10-193	Reg	40	700
10-194-JDSL	10-194	Reg	46	1000
10-195-JDSL	10-195	Reg	360	2000
10-196-JDSL	10-196	Reg	770	20000
10-197-JDSL	10-197	Reg	31	790
10-198-JDSL	10-198	Reg	51	2900
10-199-JDSL	10-199	Reg	49	1800
10-200-JDSL	10-200	Reg	46	960
10-201-JDSL	10-201	Reg	44	2600
10-202-JDSL	10-202	Reg	46	2800
10-203-JDSL	10-203	Reg	24	1100
10-204-JDSL	10-204	Reg	13	3100
10-205-JDSL	10-205	Reg	93	2100
10-206-JDSL	10-206	Reg	1100	9000
10-207-BDSL	10-207	Dup	54	670
10-207-JDSL	10-207	Reg	70	790
10-208-JDSL	10-208	Reg	13	270
10-209-JDSL	10-209	Reg	600	11000
10-210-JDSL	10-210	Reg	18	320
10-211-JDSL	10-211	Reg	1400	15000
10-212-JDSL	10-212	Reg	1700	18000
10-213-JDSL	10-213	Reg	1300	17000
10-214-JDSL	10-214	Reg	2400	33000
10-215-BDSL	10-215	Dup	2200	38000
10-215-JDSL	10-215	Reg	2300	35000
10-216-JDSL	10-216	Reg	2800	68000
10-217-JDSL	10-217	Reg	1800	39000
10-218-JDSL	10-218	Reg	3500	140000
10-219-JDSL	10-219	Reg	1000	3100
10-220-JDSL	10-220	Reg	150	14000
10-221-JDSL	10-221	Reg	72	2200
10-222-JDSL	10-222	Reg	2500	52000
10-223-JDSL	10-223	Reg	67	540
10-224-JDSL	10-224	Reg	16	510
10-225-JDSL	10-225	Reg	52	590
10-226-JDSL	10-226	Reg	22	1300
10-227-JDSL	10-227	Reg	72	960
10-228-JDSL	10-228	Reg	910	18000
10-229-JDSL	10-229	Reg	2200	34000
10-230-BDSL	10-230	Dup	1500	19000
10-230-JDSL	10-230	Reg	1500	18000
10-231-JDSL	10-231	Reg	1000	28000
10-232-JDSL	10-232	Reg	1400	38000
10-233-JDSL	10-233	Reg	4500	93000
10-234-JDSL	10-234	Reg	4500	110000
10-235-JDSL	10-235	Reg	3500	55000
10-236-JDSL	10-236	Reg	2500	110000
10-237-BDSL	10-237	Dup	6800	190000
10-237-JDSL	10-237	Reg	5100	220000

All results in mg/kg
Reg - regular sample
Dup - duplicate sample

Table 2.4
Summary of Surface Soil Data from Baseline Survey

Sample ID	Location	Sample Type	Arsenic	Copper
10-238-JDSL	10-238	Reg	1300	22000
10-239-JDSL	10-239	Reg	3100	62000
10-240-JDSL	10-240	Reg	77	870
10-241-JDSL	10-241	Reg	4000	140000
10-242-JDSL	10-242	Reg	460	11000
10-243-JDSL	10-243	Reg	31	700
10-244-JDSL	10-244	Reg	22	1100
10-245-JDSL	10-245	Reg	16	340
10-246-BDSL	10-246	Dup	30	300
10-246-JDSL	10-246	Reg	31	290
10-247-JDSL	10-247	Reg	20	340
10-248-JDSL	10-248	Reg	660	6500
10-249-JDSL	10-249	Reg	960	19000
10-250-JDSL	10-250	Reg	240	11000
10-251-BDSL	10-251	Dup	350	16000
10-251-JDSL	10-251	Reg	470	16000
10-252-JDSL	10-252	Reg	280	6500
10-253-JDSL	10-253	Reg	1400	18000
10-254-JDSL	10-254	Reg	840	14000
10-255-JDSL	10-255	Reg	2200	43000
10-256-JDSL	10-256	Reg	350	11000
10-257-JDSL	10-257	Reg	120	1900
10-258-JDSL	10-258	Reg	7900	90000
10-259-JDSL	10-259	Reg	1300	19000
10-260-JDSL	10-260	Reg	290	7800
10-261-JDSL	10-261	Reg	210	7000
10-262-JDSL	10-262	Reg	44	1400
10-263-BDSL	10-263	Dup	43	5100
10-263-JDSL	10-263	Reg	49	5100
10-264-JDSL	10-264	Reg	26	8500
10-265-JDSL	10-265	Reg	16	250
10-266-JDSL	10-266	Reg	420	5700
10-267-JDSL	10-267	Reg	420	11000
10-268-JDSL	10-268	Reg	5.5	100
10-269-JDSL	10-269	Reg	730	19000
10-270-JDSL	10-270	Reg	25	1800
10-271-BDSL	10-271	Dup	800	29000
10-271-JDSL	10-271	Reg	720	25000
10-272-JDSL	10-272	Reg	850	18000
10-273-BDSL	10-273	Dup	56	1400
10-273-JDSL	10-273	Reg	60	1300
10-274-JDSL	10-274	Reg	170	5400
10-275-JDSL	10-275	Reg	440	4500
10-276-BDSL	10-276	Dup	89	7400
10-276-JDSL	10-276	Reg	95	7300
10-277-JDSL	10-277	Reg	30	3300
10-278-JDSL	10-278	Reg	57	2300
10-279-JDSL	10-279	Reg	12	160
10-280-JDSL	10-280	Reg	84	3300
10-281-JDSL	10-281	Reg	48	810

All results in mg/kg
Reg - regular sample
Dup - duplicate sample

Table 2.4
Summary of Surface Soil Data from Baseline Survey

Sample ID	Location	Sample Type	Arsenic	Copper
10-282-JDSL	10-282	Reg	11	370
10-283-JDSL	10-283	Reg	84	3100
10-284-JDSL	10-284	Reg	33	1200
10-285-JDSL	10-285	Reg	46	1700
10-286-JDSL	10-286	Reg	36	3000

All results in mg/kg
Reg - regular sample
Dup - duplicate sample

Table 2.5
Summary of Multi-Analyte Data from Baseline Survey

Sample ID	Sampled	Units	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
10-167-JDSL	2/25/998	mg/kg	6.6	570.	84.	< .5	5.9	11.	4300.	280.	.8	10.	< 10.	9.4	< 5.	470.
10-172-JDSL	2/17/998	mg/kg	< 5.	100.	48.	< 10.	25.	< 40.	59000.	330.	.1	51.	< 200.	< 50.	100.	1200.
10-182-AESL	2/25/998	mg/kg	< 5.	250.	140.	< .5	3.8	33.	2700.	110.	.4	22.	< 10.	4.6	< 5.	260.
10-211-AFSL	2/18/998	mg/kg	< 5.	73.	170.	< .5	1.3	11.	550.	14.	.1	18.	< 10.	< 2.5	< 5.	74.
10-219-JDSL	2/24/998	mg/kg	12.	970.	150.	< 10.	21.	< 40.	28000.	500.	1.8	61.	34.	< 50.	< 100.	1100.
10-229-JDSL	2/21/998	mg/kg	31.	2300.	140.	< 10.	29.	52.	39000.	990.	3.4	72.	45.	55.	< 100.	1800.
10-234-AESL	2/19/998	mg/kg	< 5.	70.	95.	< .5	1.5	15.	810.	29.	.2	20.	< 10.	< 2.5	< 5.	98.
10-241-AESL	2/23/998	mg/kg	20.	1400.	150.	< 10.	24.	< 40.	45000.	470.	1.7	65.	< 200.	50.	100.	1200.
10-258-AESL	2/24/998	mg/kg	39.	2400.	140.	< .5	26.	< 2.	39000.	840.	4.4	63.	< 10.	50.	< 5.	1800.
10-275-AESL	2/24/998	mg/kg	< 5.	130.	170.	< .5	2.1	19.	1200.	54.	.2	15.	< 10.	< 2.5	< 5.	170.
Non-Residential SRL (mg/kg)			**680**	**10**	**11,000**	**11**	**850**	**4,500**	**63,000**	**2,000**	**180**	**3,400**	**8,500**	**8,500**	**120**	**510,000**

SRL - Soil Remediation Level

Table 2.6
Summary of Data from Locations with Subsurface Soil Samples

Location ID	Sample ID	Arsenic	Copper	Depth (inches below surface)
10-160	10-160-JDSL	190	810	0 - 0.8
10-160	10-160-AESL	130	1600	0.8 - 10
10-160	10-160-AFSL	98	730	10 - 12
10-172	10-172-JDSL	86	68000	0 - 0.8
10-172	10-172-AESL	86	36000	1 - 8
10-177	10-177-JDSL	40	3400	0 - 0.8
10-177	10-177-AESL	11	530	0.8 - 10
10-177	10-177-AFSL	20	920	10 - 12
10-182	10-182-JDSL	330	4000	0 - 0.8
10-182	10-182-AESL	230	2500	0 - 10
10-182	10-182-AFSL	31	310	10 - 20
10-187	10-187-JDSL	320	3000	0 - 0.8
10-187	10-187-AESL	72	570	1 - 10
10-187	10-187-AFSL	28	120	10 - 15
10-188	10-188-JDSL	1000	10000	0 - 0.8
10-188	10-188-AESL	250	2100	0.8 - 10
10-188	10-188-AFSL	180	1500	10 - 14
10-191	10-191-JDSL	930	11000	0 - 0.8
10-191	10-191-AESL	240	3400	0.8 - 10
10-191	10-191-AFSL	190	2700	10 - 24
10-192	10-192-JDSL	810	19000	0 - 0.8
10-192	10-192-AESL	940	11000	0.8 - 10
10-192	10-192-AFSL	120	3300	10 - 13
10-196	10-196-JDSL	770	20000	0 - 0.8
10-196	10-196-AESL	210	5900	0.8 - 8
10-209	10-209-JDSL	600	11000	0 - 0.8
10-209	10-209-AFSL	40	360	10 - 15
10-209	10-209-AESL	69	1100	0.8 - 10
10-211	10-211-JDSL	1400	15000	0 - 0.8
10-211	10-211-AESL	540	6500	0.8 - 10
10-211	10-211-AFSL	31	120	10 - 24
10-214	10-214-JDSL	2400	33000	0 - 0.8
10-214	10-214-AESL	1400	19000	1 - 10
10-217	10-217-JDSL	1800	39000	0 - 0.8
10-217	10-217-AESL	180	4300	0.8 - 10
10-217	10-217-AFSL	120	5300	10 - 19
10-218	10-218-JDSL	3500	140000	0 - 0.8
10-218	10-218-AESL	1300	35000	8 - 10
10-220	10-220-JDSL	150	14000	0 - 0.8
10-220	10-220-AESL	56	590	1 - 10
10-222	10-222-JDSL	2500	52000	0 - 0.8
10-222	10-222-AESL	300	8600	1 - 7
10-228	10-228-JDNL	570	13000	0 - 0.8
10-228	10-228-JDSL	910	18000	0 - 0.8
10-228	10-228-AESL	590	9100	1 - 10
10-228	10-228-AFSL	34	430	10 - 20
10-233	10-233-JDNL	1800	35000	0 - 0.8
10-233	10-233-JDSL	4500	93000	0 - 0.8
10-233	10-233-AESL	760	17000	1 - 10
10-233	10-233-AFSL	460	8600	10 - 15

Concentration in mg/kg

Table 2.6
Summary of Data from Locations with Subsurface Soil Samples

Location ID	Sample ID	Arsenic	Copper	Depth (inches below surface)
10-234	10-234-JDSL	4500	110000	0 - 0.8
10-234	10-234-AESL	41	680	0.8 - 8
10-237	10-237-JDSL	5100	220000	0 - 0.8
10-237	10-237-JDNL	3600	110000	0 - 0.8
10-237	10-237-AESL	940	18000	1 - 8
10-241	10-241-JDSL	4000	140000	0 - 0.8
10-241	10-241-AESL	1600	57000	0.8 - 10
10-241	10-241-AFSL	570	16000	10 - 15
10-248	10-248-JDSL	660	6500	0 - 0.8
10-248	10-248-AESL	80	660	1 - 10
10-251	10-251-JDSL	470	16000	0 - 0.8
10-251	10-251-AESL	50	830	1 - 8
10-254	10-254-JDSL	840	14000	0 - 0.8
10-254	10-254-AESL	27	620	0.8 - 10
10-254	10-254-AFSL	49	860	10 - 21
10-255	10-255-JDSL	2200	43000	0 - 0.8
10-255	10-255-AESL	200	2400	8 - 10
10-256	10-256-JDSL	350	11000	0 - 0.8
10-256	10-256-AESL	45	700	8 - 10
10-258	10-258-JDSL	7900	90000	0 - 0.8
10-258	10-258-AESL	2600	51000	1 - 10
10-258	10-258-AFSL	5400	36000	10 - 14
10-264	10-264-JDSL	26	8500	0 - 0.8
10-264	10-264-AESL	32	53	0 - 10
10-264	10-264-AFSL	47	9200	0 - 24
10-266	10-266-JDSL	420	5700	0 - 0.8
10-266	10-266-AESL	49	230	0.8 - 10
10-266	10-266-AFSL	30	83	10 - 24
10-269	10-269-JDSL	730	19000	0 - 0.8
10-269	10-269-AESL	110	3700	1 - 10
10-269	10-269-AFSL	24	200	10 - 15
10-275	10-275-JDSL	440	4500	0 - 0.8
10-275	10-275-AESL	85	370	0.8 - 10
10-275	10-275-AFSL	12	94	10 - 24
10-278	10-278-JDSL	57	2300	0 - 0.8
10-278	10-278-AESL	36	570	0 - 6
10-280	10-280-JDSL	84	3300	0 - 0.8
10-280	10-280-AESL	53	3400	0.8 - 10
10-280	10-280-AFSL	62	3100	10 - 24
10-284	10-284-JDSL	33	1200	0 - 0.8
10-284	10-284-AESL	20	48	0.8 - 10

Concentration in mg/kg

Appendix A2
Soil Sampling Event of October 2001
Soil Sample Descriptions
Data Validation Summary of SDG #99599 for the Superior Mine
Laboratory Data Sheets
Inorganic Data Assessment Summary

Superior Surface Soil Sample: Station 1

Station No. 1

Gray layer: (thickness 1/8-1/4") Oversized material: 5%>3", 20%>1"
Sample (<1" dia. material): Silty Sand with Gravel (SM), light olive gray dry (5YR 5/2), angular gravel (30%), angular to subangular coarse- to fine-grained sand (40%), silt (30%), trace clay. Low plasticity, high dilatency, loose, some organics present, reacts with HCl. Lithics primarily quartzite and granite with some chert, schist, and limestone. Gray color possibly due to higher mica content.

Underlying Soil: (Sample depth 1-1/2 to 3") Oversized material: 5%>3", 20%>1".
Sample (<1" dia. material): Silty Sand with Gravel (SM), pale brown dry (5YR 5/2), moderate brown wet (5YR 4/4) angular gravel (30%), angular to subangular coarse- to fine-grained sand (40%), silt (30%), trace clay. No plasticity, high dilatency, loose to moderately cemented, blocky structure, reacts with HCl, some lenses of caliche. Lithics primarily quartzite and granite with occasional tuff and chert.

Superior Surface Soil Sample: Station 2

Station No. 2 (Some rilling from runoff, sample collected between rills)

Gray layer: (thickness 1-1/2 to 3", irregular contact at base) Oversized material: 5%>3", 30%>1".Sample (<1" dia. material): Silty Sand with Gravel (SM), light olive gray dry (5YR 5/2), olive gray wet (5YR 3/2), angular gravel (25%), angular to subangular coarse- to fine-grained sand (40%), silt (35%), trace clay. No plasticity, high dilatency, loose to weakly cemented, no roots present, no reaction with HCl. Lithics primarily quartzite, tuff, and granite with occasional chert. Gray color possibly due to higher mica content. Some copper hydroxide staining in surface cobbles.

Underlying Soil: (Sample depth 3 to 5") Oversized material: 5%>3", 25%>1", cobbles up to 6".Sample (<1" dia. material): Clayey Sand with Gravel (SC), moderate yellowish brown dry (10YR 5/4), dark yellowish brown wet (10YR 4/2) angular gravel (20%), angular to subangular coarse- to fine-grained sand (50%), silt (30%), trace clay. Low plasticity, low dilatency, weakly cemented, blocky structure, no reaction with HCl. Lithics primarily quartzite, tuff, and granite with occasional chert.

Superior Surface Soil Sample: Station 3

Station No. 3

Gray layer: (thickness 1/2 to 2", irregular contact at base) Oversized material: 5%>3", 30%>1"

Sample (<1" dia. material): Well-graded Gravel (GW), light olive gray dry (5YR 5/2), olive gray wet (5YR 3/2), angular gravel (40%), angular to subangular coarse- to fine-grained sand (40%), silt (20%), trace clay. No plasticity, high dilatency, weakly cemented, fine roots present, no reaction with HCl. Lithics primarily quartzite, tuff, and granite with occasional chert. Gray color possibly due to higher mica content. Some copper hydroxide staining in surface cobbles.

Underlying Soil: (Sample depth 4 to 6") Oversized material: 5%>3", 20%>1", cobbles up to 6".

Sample (<1" dia. material): Silty Sand with Gravel (SM), moderate yellowish brown dry (10YR 5/4), dark yellowish brown wet (10YR 4/2) angular gravel (25%), angular to subangular coarse- to fine-grained sand (40%), silt (35%), trace clay. Low plasticity, low dilatency, loose to weakly cemented, fine roots present, reaction with HCl on carbonate grains in matrix. Lithics primarily quartzite, tuff, and granite with occasional chert. Some iron and copper hydroxide staining. Some caliche on underside of rocks.

Superior Surface Soil Sample: Station 4

Station No. 4

Gray layer: (thickness 1/2 to 1") Oversized material: 5%>3", 15% to 20%>1" Sample (<1" dia. material): Silty Sand with Gravel (SM), light olive gray dry (5YR 5/2), olive gray wet (5YR 3/2), angular gravel (25%), angular to subangular coarse- to fine-grained sand (40%), silt (35%), trace clay. No plasticity, high dilatency, weakly cemented, no roots present, no reaction with HCl. Lithics primarily quartzite, tuff, and granite with occasional chert. Gray color possibly due to higher mica content. Some copper hydroxide staining in surface cobbles.

Underlying Soil: (Sample depth 1-1/2 to 3") Oversized material: 5%>3", 20%>1" Sample (<1" dia. material): Silty Sand with Gravel (SM), moderate yellowish brown dry (10YR 5/4), dark yellowish brown wet (10YR 4/2), angular gravel (25%), angular to subangular coarse- to fine-grained sand (40%), silt (35%), trace clay. Low plasticity, low dilatency, loose to weakly cemented, no roots present, no reaction with HCl. Lithics primarily quartzite, tuff, and granite with occasional chert. Matrix includes some weathered tuff.

Superior Surface Soil Sample: Station 5

Station No. 5

Gray layer: (thickness 1/2") Oversized material: 5%>3", 20%>1"
Sample (<1" dia. material): Silty Sand with Gravel (SM), light olive gray dry (5YR 5/2), angular gravel (25%), angular to subangular coarse- to fine-grained sand (40%), silt (35%), trace clay. Low plasticity, high dilatency, loose, no roots present, no reaction with HCl. Lithics primarily quartzite, tuff, and granite with occasional chert. Gray color possibly due to higher mica content. Orange (iron) staining at base of layer.

Underlying Soil: (Sample depth 1-1/2 to 3") Oversized material: 5%>3", 20%>1"
Sample (<1" dia. material): Silty Sand with Gravel (SM), moderate yellowish brown dry (10YR 5/4), angular gravel (25%), angular to subangular coarse- to fine-grained sand (40%), silt (35%), trace clay. Low plasticity, low dilatency, loose to weakly cemented, no roots present, no reaction with HCl. Lithics primarily quartzite, tuff, and granite with occasional chert.

Superior Surface Soil Sample: Station 6

Station No. 6

Gray layer: (thickness 1/4-1/2") Oversized material: 5%>3", 20%>1"
Sample (<1" dia. material): Silty Sand with Gravel (SM), light olive gray dry(5YR 5/2), olive gray wet (5YR 3/2), angular gravel (30%), angular to subangular coarse- to fine-grained sand (50%), silt (20%), trace clay. Low plasticity, high dilatency, loose, no roots present, no reaction with HCl. Lithics primarily quartzite, tuff, granite, and basalt with occasional chert. Gray color possibly due to higher mica content.

Transition Layer: (1/2-3") Mixed, pale yellow brown (10YR 6/2).

Underlying Soil: (Sample depth 3 to 4") Oversized material: 5%>3", 20%>1"
Sample (<1" dia. material): Clayey Sand with Gravel (SC), moderate yellowish brown dry (10YR 5/4), dark yellowish brown wet (10YR 4/2) angular gravel (20%), angular to subangular coarse- to fine-grained sand (50%), silt (30%), trace clay. Low plasticity, low dilatency, weakly cemented, blocky structure, no reaction with HCl. Lithics primarily quartzite, tuff, and granite with occasional chert.

Superior Surface Soil Sample: Station 7

Station No. 7

Gray layer: (thickness 1/2-3/4") Oversized material: 5%>3", 20%>1"
Sample (<1" dia. material): Silty Sand with Gravel (SM), light olive gray dry (5YR 5/2), angular gravel (25%), angular to subangular coarse- to fine-grained sand (40%), silt (35%), trace clay. Low plasticity, high dilatency, loose, no roots present, no reaction with HCl. Lithics primarily quartzite and granite with occasional tuff and chert. Gray color possibly due to higher mica content.

Underlying Soil: (Sample depth 1-1/2 to 3") Oversized material: 5%>3", 20%>1"
Sample (<1" dia. material): Silty Sand with Gravel (SM), moderate yellowish brown dry (10YR 5/4), angular gravel (25%), angular to subangular coarse- to fine-grained sand (40%), silt (35%), trace clay. Low plasticity, low dilatency, loose to weakly cemented, no roots present, no reaction with HCl. Lithics primarily quartzite, tuff, and granite with occasional chert.

Superior Surface Soil Sample: Station 8

Station No. 8

Gray layer: (thickness 1/2") Oversized material: 10%>3", 20%>1"
Sample (<1" dia. material): Silty Sand with Gravel (SM), light olive gray dry (5YR 5/2), angular gravel (25%), angular to subangular coarse- to fine-grained sand (40%), silt (35%), trace clay. Low plasticity, high dilatency, loose to weakly cemented, no roots present, no reaction with HCl. Lithics primarily quartzite and granite with occasional tuff and chert. Gray color possibly due to higher mica content.

Underlying Soil: (Sample depth 2 to 3") Oversized material: 10%>3", 20%>1", cobbles up to 6".
Sample (<1" dia. material): Clayey Sand with Gravel (SC), moderate yellowish brown dry (10YR 5/4), dark yellowish brown wet (10YR 4/2) angular gravel (20%), angular to subangular coarse- to fine-grained sand (50%), silt (30%), trace clay. Low plasticity, low dilatency, loose to moderately cemented, blocky structure, no reaction with HCl. Lithics primarily quartzite and granite with occasional tuff and chert.

Superior Surface Soil Sample: Station 9

Station No. 9

Gray layer: (thickness 1/4 to 1/2") Oversized material: 5%>3", 20%>1"
Sample (<1" dia. material): Silty Sand with Gravel (SM), light olive gray dry (5YR 5/2), angular gravel (25%), angular to subangular coarse- to fine-grained sand (40%), silt (35%), trace clay. Low plasticity, high dilatency, loose, no roots present, no reaction with HCl. Lithics primarily quartzite, tuff, and granite with occasional chert. Gray color possibly due to higher mica content.

Underlying Soil: (Sample depth 1-1/2" to 3") Oversized material: 5%>3", 20%>1"
Sample (<1" dia. material): Silty Sand with Gravel (SM), moderate yellowish brown dry (10YR 5/4), angular gravel (25%), angular to subangular coarse- to fine-grained sand (40%), silt (35%), trace clay. Low plasticity, low dilatency, loose to weakly cemented, no roots present, no reaction with HCl. Lithics primarily quartzite, tuff, and granite with occasional chert.

DATA VALIDATION SUMMARY

MEMORANDUM

TO: Superior Environmental Investigation
Project File No. 013-2522.3

November 9, 2001

FR: Tom Stapp, Project Chemist

RE: DATA VALIDATION SUMMARY OF SDG #99559 FOR THE SUPERIOR MINE

---

1. INTRODUCTION

This memo presents the results of data validation on Sample Delivery Groups (SDG) 99559 prepared by SVL Analytical Inc., Kellogg, Idaho. Sample identifications and the analyses requested are provided in the following table.

SAMPLE ID	DATE SAMPLED	LOCATION	ANALYSES	COMMENTS
GAI-01S	10-05-01	Soil	TAL Metals[a], pH	
GAI-01D	10-05-01	Soil	"	
GAI-02S	10-05-01	Soil	"	
GAI-02D	10-05-01	Soil	"	
GAI-03S	10-05-01	Soil	"	
GAI-03D	10-05-01	Soil	"	
GAI-04S	10-05-01	Soil	"	
GAI-04D	10-05-01	Soil	"	
GAI-05S	10-05-01	Soil	"	
GAI-05D	10-05-01	Soil	"	Selected for MS/ MSD
GAI-06S	10-05-01	Soil	"	
GAI-06D	10-05-01	Soil	"	Selected for MS
GAI-07S	10-05-01	Soil	"	
GAI-07D	10-05-01	Soil	"	
GAI-08S	10-05-01	Soil	"	
GAI-08D	10-05-01	Soil	"	
GAI-09S	10-05-01	Soil	"	
GAI-09D	10-05-01	Soil	"	
GAI-11S	10-05-01	Soil	"	Field Duplicate of GAI-07S
			"	
			"	
			"	

[a]Metals: USEPA Contract Laboratory Program, Statement of Work, ILM02.1

Data validation was conducted in accordance with the USEPA Contract Laboratory Program , Inorganic Data Review (EPA 1994), and Golder Associates Inc., Technical Procedure TP-2-2-12 "Analytical Data Management" (Golder 1995b), and applicable analytical methods. The data review process provides information on analytical limitations of the data based on specific quality control (QC) criteria outlined in the referenced documents. Attachments 1 through 5 provide the following information as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Supporting Documentation

2. SAMPLE - HANDLING AND CUSTODY REQUIREMENTS

Custody of samples being sent off site for analysis were controlled and documented in accordance with technical procedure TP-1.2-23, "Chain-of-Custody." Unique sample identification numbers were recorded on the Chain-of-Custody form along with sample location, matrix, and the other required information. The analyses required for each sample were also noted on the Chain-of-Custody form as a means of specifying the analysis to be performed by the laboratory.

2.1 Metals - Acceptable

Sample custody was maintained throughout sample collection, transport, and laboratory receipt. Data to identify the holding temperature of the samples during storage, transport and at receipt at the laboratory were not provided.

3. HOLDING TIMES

3.1 Metals – Acceptable

All analyses were performed within the recommended maximum holding time.

4. CALIBRATION/INSTRUMENT PERFORMANCE MONITORING

Compliance requirements for satisfactory instrument calibration and performance monitoring were not evaluated with this data set.

5. BLANKS

The assessment of blank analysis results is to determine the existence and magnitude of contamination resulting from laboratory activities. In addition, the evaluation of field blanks are assessed to monitor field related activities and are discussed in Section 8.

5.1 Metals – Not Acceptable, Qualification Applied

Goals for preparation blank analysis were met for all analytes with the exception of tin (Sn), which was present as a low level contaminant. Associated results less than five (5) times the level identified in the blank are qualified as non-detect (U). Attachment 2 provides a summary of data quality deficiencies, the samples affected, and the qualification applied.

Continuing calibration blanks were not evaluated since raw data was not provided.

6. SYSTEM MONITORING

System monitoring serves as a monitor for specific portions or the overall performance of the analytical method. System monitoring includes instrument checks, sample batch checks, and individual sample performance checks. Data for laboratory control samples (LCS) were provided in order to evaluate the accuracy and performance of the analytical method.

6.1 Metals – Not Acceptable, Qualification Applied

Laboratory Control Sample. Goals for LCS recovery were met with the exception of recovery for strontium (Sr). Associated detects of Sr are qualified as estimated (J). Attachment 2 provides a summary of data quality deficiencies, the samples affected, and the qualification applied.

7. MATRIX SPIKE AND DUPLICATE ANALYSES

7. Metals – Not Acceptable, Qualification Required

Precision and Accuracy. A matrix spike and matrix spike duplicate (MS/MSD) analysis was performed on sample GAI-05 and a matrix spike performed on sample GAI-07. Goals for precision and accuracy were met with the exception of mercury (Hg) and antimony (Sb). Post digestion spike analysis was performed as required in the testing methodology and data validation guidelines. Results associated with the out of limit recoveries are qualified as estimated (J/UJ). Attachment 2 provides a summary of data quality deficiencies, the samples affected, and the qualification applied.

8. FIELD QUALITY CONTROL SAMPLES

A blind field duplicate sample was collected to give an indication of overall field sampling precision, and overall performance. The field duplicate result may have more variability than laboratory duplicates, which measures only analytical or method precision. A field blank is

analyzed to determine the existence and magnitude of contamination resulting from field activities however, there was not a field blank included with this data set.

8.1 Metals - Acceptable

Field Duplicate. Sample GAI-11S was identified as a field duplicate of sample GAI-07S. Precision goals were achieved for all analytes detected. No qualification is applied. A summary of field duplicate results is provided in Table A-5.2, Attachment 5.

Field Blanks. There was not a field blank sample identified in this data set. Associated sample results are not qualified as a result of field blank evaluation.

9. OVERALL ASSESSMENT

Overall assessment was performed on the entire data package. Review of the data results was performed in conjunction with the governing Plan.

9.1 Metals - Acceptable

Detection Limits. Detection limit goals were met for all results.

Target Analyte Identification and Quantitation. All sample results in the hard copy report were confirmed with results found in the electronic data format. Analyte identification and quantitation could not be confirmed with raw data results since the raw data was not provided with this sample set.

Completeness. The data package was complete for all requested analyses. A total of nineteen (19) samples were validated in this data package with a total of 456 determinations reported, of which 456 were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90 percent.

10. DATA VALIDATION AND USABILITY

Data were validated by Golder personnel, based on the applicable elements of the USEPA Functional Guidelines for Inorganic Data Review (EPA 1994), USEPA Contract Laboratory Program, Golder technical procedure TP-2-2-12 "Analytical Data Management" (Golder 1995), and applicable reference method requirements as appropriate.

Data generated in the field or by the subcontractor laboratory were reviewed. Original data was copied and retained in the project file. Working copies were distributed to personnel designated by the Lead Analytical Chemist for validating/verifying analytical data or to the Data Management Specialist.

Validation/verification and data management activities were organized by analytical fraction (i.e. Ordnance, General Chemistry, Metals). All hard copy or electronic deliverable data were reviewed against chain-of-custody for verification of sample identification and analyses requested. Any incorrect data or discrepancies noted in the verification were resolved with project management and/or the data generator. Any corrections to the original data were noted on the batch log and corrected data sheets were issued if necessary. After the completion of data validation/verification any qualifiers or other comments noted in the validation/verification process assigned to the data were entered into this data quality report and the data validation checklist (Attachment 5). A glossary of data qualifiers is provided in Attachment 1.

The analytical data resulting from analysis of soil are acceptable for their intended use with the exception of those deficiencies noted. Limitations and sources of existing data are stated and clearly identified where applicable. Validated data are included in Attachment 3.

11. REFERENCES

EPA 1994, USEPA Contract Laboratory Program, National Functional Guidelines for Inorganic Data Review, EPA-540/R-94-013, February 1994.

Golder 1995b, Golder Associates Inc., Technical Procedure TP-2.2-12 "Analytical Data Management."

Attachment 1

GLOSSARY OF DATA REPORTING QUALIFIERS

INORGANIC:

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.

B: The associated value is greater than the instrument detection limit but less than the associated quantitation limit.

J: The associated value is an estimated quantity.

R: The data are unusable. (Note: Analyte may or may not be present)

UJ: The material was analyzed for, but not detected. The associated value is an estimate and may be inaccurate or imprecise.

TABLE A-2.1

DATA QUALIFICATION SUMMARY

SDG: 99559	Project: 013-2376.3	Date: 11-08-01	Page 1 of 1	
Comments:				
Parameter	**Qualifier**	**Samples Affected**	**Reason**	**Value**
Sn	U	GAI-01D, GAI-02D, GAI-03D, GAI-04D, GAI-05D, GAI-06D, GAI-07D, GAI-09D	Contaminant detected in Preparation Blank	1.5 mg/Kg
Sr	J	All Samples	LCS recovery exceeds 120%	121.3%
Hg, Sb	J/UJ	All Samples	MS / MSD recovery below 75%	66%, 53%

Attachment 2

SUMMARY OF DATA QUALIFICATIONS

Attachment 3

SUPPORTING DOCUMENTATION

TABLE A-5.1

SAMPLES EXCEEDING MAXIMUM HOLDING TIME

SDG: 99559			Project: 013-2376.3		Date: 11-08-01		Page 1 of 1
Comments:							
Field Sample ID	**Analysis Type**	**Date Sampled**	**Date Prepared**	**Date Analyzed**	**Prep. MHT Days**	**Analy. MHT Days**	**Qualifier**
GAI-01S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-01D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-02S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-02D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-03S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-03D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-04S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-04D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-05S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-05D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-06S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-06D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-07S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-07D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-08S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-08D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-09S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-09D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-11S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None

TABLE A-5.2

FIELD DUPLICATE SUMMARY

SDG: 99559	PROJECT: 013-2376.3	DATE: 11-08-01	PAGE 1 OF 1
COMMENT: FIELD SAMPLE ID GAI-07S; BLIND DUPLICATE ID GAI-11S			
COMPOUND/ANALYTE	SAMPLE RESULT GAI-07S	DUPLICATE RESULT GAI-11S	RELATIVE PERCENT DIFFERENCE (RPD)
	METALS (mg/Kg):		(%)
PH Pst	6.3	6.02	-4.5
Sn	32	35	9.0
Ag	123	124	0.8
Al	9310	9400	1.0
As	3050	4190	31.5
B	<40	<40	0.0
Ba	91.5	99.2	8.1
Be	<2	<2	0.0
Cd	14.6	16.8	14.0
Co	21.8	22.4	2.7
Cr	13.6	11.6	-15.9
Cu	99600	98300	-1.3
Fe	84100	79400	-5.7
Hg	5.71	7.82	31.2
Mn	768	884	14.0
Mo	<8	<8	0.0
Ni	24	28	15.4
Pb	1280	1520	17.1
Sb	43.1	54.6	23.5
Se	<10	<10	0.0
Sr	42.6	43.5	2.1
Tl	<10	<10	0.0
V	52.2	43.3	-18.6
Zn	2870	2960	3.1

LABORATORY DATA SHEETS

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891
Certificate: AR AR0539

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-1S
Sample Collected: 10/05/01 16:25
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279610
% Solids: 99.9%
Matrix: SOIL

Determination	Result	Units		Dilution	Method	Analyzed
pH Paste	8.02				ASA M9	10/18/01
Tin	16.0	mg/kg		10	6010B	10/22/01
Silver	29.1	mg/kg		10	6010B	10/22/01
Aluminum	11400	mg/kg		10	6010B	10/22/01
Arsenic	661	mg/kg		10	6010B	10/22/01
Boron	<40*	mg/kg	U	10	6010B	10/22/01
Barium	120	mg/kg		10	6010B	10/22/01
Beryllium	<2.0*	mg/kg	U	10	6010B	10/22/01
Cadmium	9.3	mg/kg		10	6010B	10/22/01
Cobalt	17.8	mg/kg		10	6010B	10/22/01
Chromium	31.9	mg/kg		10	6010B	10/22/01
Copper	22100	mg/kg		10	6010B	10/23/01
Iron	50600	mg/kg		10	6010B	10/22/01
Mercury	1.09	mg/kg	J		7471	10/15/01
Manganese	671	mg/kg		10	6010B	10/22/01
Molybdenum	<8.0*	mg/kg	U	10	6010B	10/22/01
Nickel	21.0	mg/kg		10	6010B	10/22/01
Lead	525	mg/kg		10	6010B	10/22/01
Antimony	12.0	mg/kg	J	10	6010B	10/22/01
Selenium	<10*	mg/kg	U	10	6010B	10/22/01
Strontium	66.7	mg/kg	J	10	6010B	10/22/01
Thallium	<10*	mg/kg	U	10	6010B	10/22/01
Vanadium	93.0	mg/kg		10	6010B	10/22/01
Zinc	1230	mg/kg		10	6010B	10/22/01

*Elevated detection limit due to matrix interference.
SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer
Date 10/24/01
10/24/01 11:03

17

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Certificate: AI AK0538
Phone: (208)784-1258 ■ Fax: (208)783-0891

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-1D
Sample Collected: 10/05/01 16:35
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279611

% Solids: 99.1%
Matrix: SOIL

Determination	Result	Units	Q	Dilution	Method	Analyzed
pH Paste	6.47				ASA M9	10/18/01
Tin	~~3.2~~	mg/kg	U		6010B	10/22/01
Silver	3.3	mg/kg			6010B	10/22/01
Aluminum	15400	mg/kg			6010B	10/22/01
Arsenic	66.7	mg/kg			6010B	10/22/01
Boron	<4.0	mg/kg	U		6010B	10/22/01
Barium	115	mg/kg			6010B	10/22/01
Beryllium	0.5	mg/kg			6010B	10/22/01
Cadmium	1.8	mg/kg			6010B	10/22/01
Cobalt	13.6	mg/kg			6010B	10/22/01
Chromium	27.3	mg/kg			6010B	10/22/01
Copper	1280	mg/kg		10	6010B	10/23/01
Iron	29500	mg/kg			6010B	10/22/01
Mercury	0.270	mg/kg	J		7471	10/15/01
Manganese	408	mg/kg			6010B	10/22/01
Molybdenum	1.5	mg/kg			6010B	10/22/01
Nickel	16.9	mg/kg			6010B	10/22/01
Lead	44.0	mg/kg			6010B	10/22/01
Antimony	2.3	mg/kg	J		6010B	10/22/01
Selenium	<1.0	mg/kg	U		6010B	10/22/01
Strontium	137	mg/kg	J		6010B	10/22/01
Thallium	<1.0	mg/kg	U		6010B	10/22/01
Vanadium	77.8	mg/kg			6010B	10/22/01
Zinc	113	mg/kg			6010B	10/22/01

SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer

Date 10/24/01
10/24/01 11:03

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891
Certificate: AI AI0530

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-2S
Sample Collected: 10/05/01 12:40
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279601
% Solids: 99.8%
Matrix: SOIL

Determination	Result	Units	Q	Dilution	Method	Analyzed
pH Paste	6.37				ASA M9	10/18/01
Tin	58.0	mg/kg		10	6010B	10/22/01
Silver	112	mg/kg		10	6010B	10/22/01
Aluminum	6950	mg/kg		10	6010B	10/22/01
Arsenic	4350	mg/kg		10	6010B	10/22/01
Boron	<40*	mg/kg	U	10	6010B	10/22/01
Barium	69.7	mg/kg		10	6010B	10/22/01
Beryllium	<2.0*	mg/kg	U	10	6010B	10/22/01
Cadmium	15.2	mg/kg		10	6010B	10/22/01
Cobalt	27.5	mg/kg		10	6010B	10/22/01
Chromium	10.4	mg/kg		10	6010B	10/22/01
Copper	199000	mg/kg		100	6010B	10/23/01
Iron	86100	mg/kg		10	6010B	10/22/01
Mercury	6.51	mg/kg	J	10	7471	10/15/01
Manganese	600	mg/kg		10	6010B	10/22/01
Molybdenum	<8.0*	mg/kg	U	10	6010B	10/22/01
Nickel	33.0	mg/kg		10	6010B	10/22/01
Lead	1550	mg/kg		10	6010B	10/22/01
Antimony	68.3	mg/kg	J	10	6010B	10/22/01
Selenium	<10*	mg/kg	U	10	6010B	10/22/01
Strontium	31.4	mg/kg	J	10	6010B	10/22/01
Thallium	<10*	mg/kg	U	10	6010B	10/22/01
Vanadium	25.0	mg/kg		10	6010B	10/22/01
Zinc	4340	mg/kg		10	6010B	10/22/01

*Elevated detection limit due to matrix interference.
SIEVED -60 MESH

Reviewed By: Kirby Gray Date 10/24/01
Kirby Gray, Project Officer 10/24/01 11:02

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891
Certificate: AZ AZ0538

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-2D
Sample Collected: 10/05/01 12:55
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279602
% Solids: 95.2%
Matrix: SOIL

Determination	Result	Units	Q	Dilution	Method	Analyzed
pH Paste	4.93				ASA M9	10/18/01
Tin	~~3.5~~ TR8 #5 stet	mg/kg	U		6010B	10/22/01
Silver	2.5	mg/kg			6010B	10/22/01
Aluminum	22700	mg/kg			6010B	10/22/01
Arsenic	351	mg/kg			6010B	10/22/01
Boron	<4.0	mg/kg	U		6010B	10/22/01
Barium	151	mg/kg			6010B	10/22/01
Beryllium	0.9	mg/kg			6010B	10/22/01
Cadmium	4.9	mg/kg			6010B	10/22/01
Cobalt	11.9	mg/kg			6010B	10/22/01
Chromium	19.2	mg/kg			6010B	10/22/01
Copper	4630	mg/kg			6010B	10/22/01
Iron	29500	mg/kg			6010B	10/22/01
Mercury	0.612	mg/kg	J		7471	10/15/01
Manganese	438	mg/kg			6010B	10/22/01
Molybdenum	1.2	mg/kg			6010B	10/22/01
Nickel	13.5	mg/kg			6010B	10/22/01
Lead	34.8	mg/kg			6010B	10/22/01
Antimony	2.6	mg/kg	J		6010B	10/22/01
Selenium	<1.0	mg/kg	U		6010B	10/22/01
Strontium	118	mg/kg	J		6010B	10/22/01
Thallium	<1.0	mg/kg	U		6010B	10/22/01
Vanadium	64.8	mg/kg			6010B	10/22/01
Zinc	418	mg/kg			6010B	10/22/01

SIEVED -60 MESH

Reviewed By: *Kirby Gray*
Kirby Gray, Project Officer

Date *10/24/01*
10/24/01 11:02

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Certificate: A2 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891 A50538

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-3S
Sample Collected: 10/05/01 11:55
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279599
% Solids: 99.8%
Matrix: SOIL

Determination	Result	Units	Dilution	Method	Analyzed
pH Paste	6.52			ASA M9	10/18/01
Tin	71.0	mg/kg	10	6010B	10/22/01
Silver	135	mg/kg	10	6010B	10/22/01
Aluminum	6820	mg/kg	10	6010B	10/22/01
Arsenic	6990	mg/kg	10	6010B	10/22/01
Boron	<40*	mg/kg U	10	6010B	10/22/01
Barium	86.0	mg/kg	10	6010B	10/22/01
Beryllium	<2.0*	mg/kg U	10	6010B	10/22/01
Cadmium	17.6	mg/kg	10	6010B	10/22/01
Cobalt	35.9	mg/kg	10	6010B	10/22/01
Chromium	11.4	mg/kg	10	6010B	10/22/01
Copper	259000	mg/kg	100	6010B	10/23/01
Iron	107000	mg/kg	10	6010B	10/22/01
Mercury	10.8	mg/kg J	10	7471	10/15/01
Manganese	660	mg/kg	10	6010B	10/22/01
Molybdenum	<8.0*	mg/kg U	10	6010B	10/22/01
Nickel	34.0	mg/kg	10	6010B	10/22/01
Lead	2070	mg/kg	10	6010B	10/22/01
Antimony	106	mg/kg J	10	6010B	10/22/01
Selenium	13.0	mg/kg	10	6010B	10/22/01
Strontium	30.4	mg/kg J	10	6010B	10/22/01
Thallium	<10*	mg/kg U	10	6010B	10/22/01
Vanadium	24.8	mg/kg	10	6010B	10/22/01
Zinc	4670	mg/kg	10	6010B	10/22/01

*Elevated detection limit due to matrix interference.
SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer
Date 10/24/01
10/24/01 11:02

SVL ANALYTICAL, INC.
One Government Gulch ▪ P.O. Box 929 ▪ Kellogg, Idaho 83837-0929 ▪ Certificate: AS Phone: (208)784-1258 ▪ Fax: (208)783-0891 A20536

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-3D
Sample Collected: 10/05/01 12:05
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279600
% Solids: 98.7%
Matrix: SOIL

Determination	Result	Units	Q	Dilution	Method	Analyzed
pH Paste	6.87					
Tin	7068 ~~75~~ ~~4.0~~ stet	mg/kg	U		ASA M9	10/18/01
Silver	5.2	mg/kg			6010B	10/22/01
Aluminum	20000	mg/kg			6010B	10/22/01
Arsenic	296	mg/kg			6010B	10/22/01
Boron	<4.0	mg/kg	U		6010B	10/22/01
Barium	127	mg/kg			6010B	10/22/01
Beryllium	0.8	mg/kg			6010B	10/22/01
Cadmium	5.5	mg/kg			6010B	10/22/01
Cobalt	13.6	mg/kg			6010B	10/22/01
Chromium	20.1	mg/kg			6010B	10/22/01
Copper	5230	mg/kg			6010B	10/22/01
Iron	30400	mg/kg			6010B	10/22/01
Mercury	0.316	mg/kg	J		7471	10/15/01
Manganese	552	mg/kg			6010B	10/22/01
Molybdenum	1.3	mg/kg			6010B	10/22/01
Nickel	16.6	mg/kg			6010B	10/22/01
Lead	47.6	mg/kg			6010B	10/22/01
Antimony	2.6	mg/kg	J		6010B	10/22/01
Selenium	<1.0	mg/kg	U		6010B	10/22/01
Strontium	116	mg/kg	J		6010B	10/22/01
Thallium	<1.0	mg/kg	U		6010B	10/22/01
Vanadium	68.9	mg/kg			6010B	10/22/01
Zinc	561	mg/kg			6010B	10/22/01

SIEVED -60 MESH

Reviewed By: *Kirby Gray* Date *10/24/01*
Kirby Gray, Project Officer
10/24/01 11:02

7

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Certificate: AZ AZ0538
Phone: (208)784-1258 ■ Fax: (208)783-0891

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-4S
Sample Collected: 10/05/01 10:50
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279597
% Solids: 99.8%
Matrix: SOIL

Determination	Result	Units	Dilution	Method	Analyzed
pH Paste	6.66			ASA M9	10/18/01
Tin	53.0	mg/kg	10	6010B	10/22/01
Silver	125	mg/kg	10	6010B	10/22/01
Aluminum	9060	mg/kg	10	6010B	10/22/01
Arsenic	4300	mg/kg	10	6010B	10/22/01
Boron	<40*	mg/kg U	10	6010B	10/22/01
Barium	89.7	mg/kg	10	6010B	10/22/01
Beryllium	<2.0*	mg/kg U	10	6010B	10/22/01
Cadmium	12.3	mg/kg	10	6010B	10/22/01
Cobalt	23.9	mg/kg	10	6010B	10/22/01
Chromium	27.3	mg/kg	10	6010B	10/22/01
Copper	176000	mg/kg	100	6010B	10/23/01
Iron	83400	mg/kg	10	6010B	10/22/01
Mercury	4.99	mg/kg J	10	7471	10/15/01
Manganese	726	mg/kg	10	6010B	10/22/01
Molybdenum	<8.0*	mg/kg U	10	6010B	10/22/01
Nickel	22.0	mg/kg	10	6010B	10/22/01
Lead	1290	mg/kg	10	6010B	10/22/01
Antimony	54.7	mg/kg J	10	6010B	10/22/01
Selenium	11.0	mg/kg	10	6010B	10/22/01
Strontium	40.8	mg/kg J	10	6010B	10/22/01
Thallium	<10*	mg/kg U	10	6010B	10/22/01
Vanadium	36.6	mg/kg	10	6010B	10/22/01
Zinc	4060	mg/kg	10	6010B	10/22/01

*Elevated detection limit due to matrix interference.
SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer
Date 10/24/01
10/24/01 11:02

SVL ANALYTICAL, INC.
One Government Gulch # P.O. Box 929 # Kellogg, Idaho 83837-0929 # Certificate: AZ Phone: (208)784-1258 # Fax: (208)783-0891

AS0538

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-4D
Sample Collected: 10/05/01 11:15
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279598

% Solids: 98.9%
Matrix: SOIL

Determination	Result	Units	Q	Dilution	Method	Analyzed
pH Paste	5.91				ASA M9	10/18/01
Tin	~~4.4~~	mg/kg	U		6010B	10/22/01
Silver	4.8	mg/kg			6010B	10/22/01
Aluminum	19900	mg/kg			6010B	10/22/01
Arsenic	271	mg/kg			6010B	10/22/01
Boron	<4.0*	mg/kg	U		6010B	10/22/01
Barium	155	mg/kg			6010B	10/22/01
Beryllium	0.8	mg/kg			6010B	10/22/01
Cadmium	3.5	mg/kg			6010B	10/22/01
Cobalt	12.0	mg/kg			6010B	10/22/01
Chromium	14.0	mg/kg			6010B	10/22/01
Copper	4610	mg/kg			6010B	10/22/01
Iron	26600	mg/kg			6010B	10/22/01
Mercury	0.204	mg/kg	J		7471	10/15/01
Manganese	474	mg/kg			6010B	10/22/01
Molybdenum	1.3	mg/kg			6010B	10/22/01
Nickel	10.8	mg/kg			6010B	10/22/01
Lead	42.4	mg/kg			6010B	10/22/01
Antimony	2.3	mg/kg	J		6010B	10/22/01
Selenium	<1.0*	mg/kg	U		6010B	10/22/01
Strontium	115	mg/kg	J		6010B	10/22/01
Thallium	<1.0*	mg/kg	U		6010B	10/22/01
Vanadium	57.5	mg/kg			6010B	10/22/01
Zinc	478	mg/kg			6010B	10/22/01

*Elevated detection limit due to matrix interference.
SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer

Date 10/24/01
10/24/01 11:02

5

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Certificate: AS AS0538
Phone: (208)784-1258 ■ Fax: (208)783-0891

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-5S
Sample Collected: 10/05/01 9:30
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279595
% Solids: 99.8%
Matrix: SOIL

Determination	Result	Units	Q	Dilution	Method	Analyzed
pH Paste	4.59				ASA M9	10/18/01
Tin	<10*	mg/kg	U	10	6010B	10/22/01
Silver	14.4	mg/kg		10	6010B	10/22/01
Aluminum	11700	mg/kg		10	6010B	10/22/01
Arsenic	448	mg/kg		10	6010B	10/22/01
Boron	<40*	mg/kg	U	10	6010B	10/22/01
Barium	83.3	mg/kg		10	6010B	10/22/01
Beryllium	<2.0*	mg/kg	U	10	6010B	10/22/01
Cadmium	4.8	mg/kg		10	6010B	10/22/01
Cobalt	11.1	mg/kg		10	6010B	10/22/01
Chromium	12.8	mg/kg		10	6010B	10/22/01
Copper	6590	mg/kg		10	6010B	10/23/01
Iron	81100	mg/kg		10	6010B	10/22/01
Mercury	0.542	mg/kg	J		7471	10/15/01
Manganese	465	mg/kg		10	6010B	10/22/01
Molybdenum	<8.0*	mg/kg	U	10	6010B	10/22/01
Nickel	<10*	mg/kg	U	10	6010B	10/22/01
Lead	207	mg/kg		10	6010B	10/22/01
Antimony	6.1	mg/kg	J	10	6010B	10/22/01
Selenium	<10*	mg/kg	U	10	6010B	10/22/01
Strontium	58.2	mg/kg	J	10	6010B	10/22/01
Thallium	<10*	mg/kg	U	10	6010B	10/22/01
Vanadium	58.0	mg/kg		10	6010B	10/22/01
Zinc	563	mg/kg		10	6010B	10/22/01

*Elevated detection limit due to matrix interference.
SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer
Date 10/24/01
10/24/01 11:02

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Certificate: AZ AZ0638
Phone: (208)784-1258 ■ Fax: (208)783-0891

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-5D
Sample Collected: 10/05/01 9:40
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279596
% Solids: 98.5%
Matrix: SOIL

Determination	Result	Units	Q	Dilution	Method	Analyzed
pH Paste	4.33				ASA M9	10/18/01
Tin	~~TNTC~~ ~~7.5~~ 2.8 stet	mg/kg	U		6010B	10/22/01
Silver	1.7	mg/kg			6010B	10/22/01
Aluminum	22000	mg/kg			6010B	10/22/01
Arsenic	82.1	mg/kg			6010B	10/22/01
Boron	<4.0	mg/kg	U		6010B	10/22/01
Barium	186	mg/kg			6010B	10/22/01
Beryllium	0.8	mg/kg			6010B	10/22/01
Cadmium	2.7	mg/kg			6010B	10/22/01
Cobalt	13.9	mg/kg			6010B	10/22/01
Chromium	13.0	mg/kg			6010B	10/22/01
Copper	1660	mg/kg			6010B	10/22/01
Iron	29500	mg/kg			6010B	10/22/01
Mercury	0.081	mg/kg	J		7471	10/15/01
Manganese	559	mg/kg			6010B	10/22/01
Molybdenum	1.3	mg/kg			6010B	10/22/01
Nickel	7.2	mg/kg			6010B	10/22/01
Lead	15.6	mg/kg			6010B	10/22/01
Antimony	0.8	mg/kg	J		6010B	10/22/01
Selenium	<1.0	mg/kg	U		6010B	10/22/01
Strontium	136	mg/kg	J		6010B	10/22/01
Thallium	<1.0	mg/kg	U		6010B	10/22/01
Vanadium	63.1	mg/kg			6010B	10/22/01
Zinc	156	mg/kg			6010B	10/22/01

SIEVED -60 MESH

Reviewed By: Kirby Gray Date 10/24/01
Kirby Gray, Project Officer 10/24/01 11:02

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Certificate: AS A20638
Phone: (208)784-1258 ■ Fax: (208)783-0891

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-6S
Sample Collected: 10/05/01 14:30
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279603
% Solids: 99.9%
Matrix: SOIL

Determination	Result	Units	Dilution	Method	Analyzed
pH Paste	6.12			ASA M9	10/18/01
Tin	45.0	mg/kg	10	6010B	10/22/01
Silver	98.8	mg/kg	10	6010B	10/22/01
Aluminum	9370	mg/kg	10	6010B	10/22/01
Arsenic	2410	mg/kg	10	6010B	10/22/01
Boron	<40*	mg/kg U	10	6010B	10/22/01
Barium	92.2	mg/kg	10	6010B	10/22/01
Beryllium	<2.0*	mg/kg U	10	6010B	10/22/01
Cadmium	12.5	mg/kg	10	6010B	10/22/01
Cobalt	18.2	mg/kg	10	6010B	10/22/01
Chromium	13.2	mg/kg	10	6010B	10/22/01
Copper	72000	mg/kg	100	6010B	10/23/01
Iron	78700	mg/kg	10	6010B	10/22/01
Mercury	4.60	mg/kg J	10	7471	10/15/01
Manganese	749	mg/kg	10	6010B	10/22/01
Molybdenum	<8.0*	mg/kg U	10	6010B	10/22/01
Nickel	21.0	mg/kg	10	6010B	10/22/01
Lead	1050	mg/kg	10	6010B	10/22/01
Antimony	34.7	mg/kg J	10	6010B	10/22/01
Selenium	<10*	mg/kg U	10	6010B	10/22/01
Strontium	36.7	mg/kg J	10	6010B	10/22/01
Thallium	<10*	mg/kg U	10	6010B	10/22/01
Vanadium	48.3	mg/kg	10	6010B	10/22/01
Zinc	2390	mg/kg	10	6010B	10/22/01

*Elevated detection limit due to matrix interference.
SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer

Date 10/24/01
10/24/01 11:02

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891
Certificate: AK AK0539

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-6D
Sample Collected: 10/05/01 14:40
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279604
% Solids: 98.5%
Matrix: SOIL

Determination	Result	Units	Q	Dilution	Method	Analyzed
pH Paste	5.22				ASA M9	10/18/01
Tin	~~3.6~~	mg/kg	U		6010B	10/22/01
Silver	3.4	mg/kg			6010B	10/22/01
Aluminum	20300	mg/kg			6010B	10/22/01
Arsenic	218	mg/kg			6010B	10/22/01
Boron	<4.0	mg/kg	U		6010B	10/22/01
Barium	131	mg/kg			6010B	10/22/01
Beryllium	0.8	mg/kg			6010B	10/22/01
Cadmium	3.0	mg/kg			6010B	10/22/01
Cobalt	11.9	mg/kg			6010B	10/22/01
Chromium	16.6	mg/kg			6010B	10/22/01
Copper	3120	mg/kg			6010B	10/22/01
Iron	31100	mg/kg			6010B	10/22/01
Mercury	0.218	mg/kg	J		7471	10/15/01
Manganese	521	mg/kg			6010B	10/22/01
Molybdenum	1.2	mg/kg			6010B	10/22/01
Nickel	7.1	mg/kg			6010B	10/22/01
Lead	35.5	mg/kg			6010B	10/22/01
Antimony	2.1	mg/kg	J		6010B	10/22/01
Selenium	<1.0	mg/kg	U		6010B	10/22/01
Strontium	97.6	mg/kg	J		6010B	10/22/01
Thallium	<1.0	mg/kg	U		6010B	10/22/01
Vanadium	78.2	mg/kg			6010B	10/22/01
Zinc	222	mg/kg			6010B	10/22/01

SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer
Date 10/24/01
10/24/01 11:02

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Certificate: 32 AK0538
Phone: (208)784-1258 ■ Fax: (208)783-0891

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-7S
Sample Collected: 10/05/01 15:10
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279605

% Solids: 100.0%
Matrix: SOIL

Determination	Result	Units	Q	Dilution	Method	Analyzed
pH Paste	6.30					
Tin	32.0	mg/kg		10	ASA M9	10/18/01
Silver	123	mg/kg		10	6010B	10/22/01
Aluminum	9310	mg/kg		10	6010B	10/22/01
Arsenic	3050	mg/kg	J	10	6010B	10/22/01
Boron	<40*	mg/kg	U	10	6010B	10/22/01
Barium	91.5	mg/kg		10	6010B	10/22/01
Beryllium	<2.0*	mg/kg	U	10	6010B	10/22/01
Cadmium	14.6	mg/kg		10	6010B	10/22/01
Cobalt	21.8	mg/kg		10	6010B	10/22/01
Chromium	13.6	mg/kg		10	6010B	10/22/01
Copper	99600	mg/kg		100	6010B	10/23/01
Iron	84100	mg/kg		10	6010B	10/22/01
Mercury	5.71	mg/kg	J	10	7471	10/15/01
Manganese	768	mg/kg		10	6010B	10/22/01
Molybdenum	<8.0*	mg/kg	U	10	6010B	10/22/01
Nickel	24.0	mg/kg		10	6010B	10/22/01
Lead	1280	mg/kg		10	6010B	10/22/01
Antimony	43.1	mg/kg	J	10	6010B	10/22/01
Selenium	<10*	mg/kg	U	10	6010B	10/22/01
Strontium	42.6	mg/kg	J	10	6010B	10/22/01
Thallium	<10*	mg/kg	U	10	6010B	10/22/01
Vanadium	52.2	mg/kg		10	6010B	10/22/01
Zinc	2870	mg/kg		10	6010B	10/22/01

*Elevated detection limit due to matrix interference.
SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer
Date 10/24/01
10/24/01 11:02

SVL ANALYTICAL, INC.
One Government Gulch • P.O. Box 929 • Kellogg, Idaho 83837-0929 • Certificate: A2 • Phone: (208)784-1258 • FAX: (208)783-0891 • AI0548

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-7D
Sample Collected: 10/05/01 15:20
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279606
% Solids: 99.2%
Matrix: SOIL

Determination	Result	Units	Dilution	Method	Analyzed
pH Paste	5.62			ASA M9	10/18/01
Tin	~~4.1~~ stet	mg/kg	U	6010B	10/22/01
Silver	6.1	mg/kg		6010B	10/22/01
Aluminum	20700	mg/kg		6010B	10/22/01
Arsenic	357	mg/kg		6010B	10/22/01
Boron	<4.0	mg/kg	U	6010B	10/22/01
Barium	135	mg/kg		6010B	10/22/01
Beryllium	0.7	mg/kg		6010B	10/22/01
Cadmium	4.2	mg/kg		6010B	10/22/01
Cobalt	10.6	mg/kg		6010B	10/22/01
Chromium	16.9	mg/kg		6010B	10/22/01
Copper	5650	mg/kg		6010B	10/22/01
Iron	32500	mg/kg		6010B	10/22/01
Mercury	0.448	mg/kg	J	7471	10/15/01
Manganese	317	mg/kg		6010B	10/22/01
Molybdenum	1.3	mg/kg		6010B	10/22/01
Nickel	8.9	mg/kg		6010B	10/22/01
Lead	86.8	mg/kg		6010B	10/22/01
Antimony	5.1	mg/kg	J	6010B	10/22/01
Selenium	<1.0	mg/kg	U	6010B	10/22/01
Strontium	107	mg/kg	J	6010B	10/22/01
Thallium	<1.0	mg/kg	U	6010B	10/22/01
Vanadium	76.0	mg/kg		6010B	10/22/01
Zinc	350	mg/kg		6010B	10/22/01

SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer
Date 10/24/01
10/24/01 11:02

SVL ANALYTICAL, INC.
Certificate: A2 A80538
One Government Gulch ■ P.O. Box 922 ■ Kellogg, Idaho 83837-0922 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-11S
Sample Collected: 10/05/01 15:20
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279607
% Solids: 100.0%
Matrix: SOIL

Determination	Result	Units	Dilution	Method	Analyzed
pH Paste	6.02			ASA M9	10/18/01
Tin	35.0	mg/kg	10	6010B	10/22/01
Silver	124	mg/kg	10	6010B	10/22/01
Aluminum	9400	mg/kg	10	6010B	10/22/01
Arsenic	4190	mg/kg	10	6010B	10/22/01
Boron	<40*	mg/kg U	10	6010B	10/22/01
Barium	99.2	mg/kg	10	6010B	10/22/01
Beryllium	<2.0*	mg/kg U	10	6010B	10/22/01
Cadmium	16.8	mg/kg	10	6010B	10/22/01
Cobalt	22.4	mg/kg	10	6010B	10/22/01
Chromium	11.6	mg/kg	10	6010B	10/22/01
Copper	98300	mg/kg	100	6010B	10/23/01
Iron	79400	mg/kg	10	6010B	10/22/01
Mercury	7.82	mg/kg J	10	7471	10/15/01
Manganese	884	mg/kg	10	6010B	10/22/01
Molybdenum	<8.0*	mg/kg U	10	6010B	10/22/01
Nickel	28.0	mg/kg	10	6010B	10/22/01
Lead	1520	mg/kg	10	6010B	10/22/01
Antimony	54.6	mg/kg J	10	6010B	10/22/01
Selenium	<10*	mg/kg U	10	6010B	10/22/01
Strontium	43.5	mg/kg J	10	6010B	10/22/01
Thallium	<10*	mg/kg U	10	6010B	10/22/01
Vanadium	43.3	mg/kg	10	6010B	10/22/01
Zinc	2960	mg/kg	10	6010B	10/22/01

*Elevated detection limit due to matrix interference.
SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer
Date 10/24/01
10/24/01 11:02

SVL ANALYTICAL, INC.
One Government Gulch # P.O. Box 929 # Kellogg, Idaho 83837-0929 # Certificate: AS AE0535
Phone: (208)784-1258 # Fax: (208)783-0851

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-8@D KJ 11/15/01 SEE TEL. CONV. RECORD WITH K. GRAY (SVL)
Sample Collected: 10/05/01 15:45
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279608
% Solids: 98.1%
Matrix: SOIL

Determination	Result	Units	Dilution	Method	Analyzed
pH Paste	6.33			ASA M9	10/18/01
Tin	<10*	mg/kg U	10	6010B	10/22/01
Silver	<5.0*	mg/kg U	10	6010B	10/22/01
Aluminum	16500	mg/kg	10	6010B	10/22/01
Arsenic	246	mg/kg	10	6010B	10/22/01
Boron	<40*	mg/kg	10	6010B	10/22/01
Barium	133	mg/kg	10	6010B	10/22/01
Beryllium	<2.0*	mg/kg U	10	6010B	10/22/01
Cadmium	3.6	mg/kg	10	6010B	10/22/01
Cobalt	13.1	mg/kg	10	6010B	10/22/01
Chromium	16.7	mg/kg	10	6010B	10/22/01
Copper	3390	mg/kg	10	6010B	10/23/01
Iron	31200	mg/kg	10	6010B	10/22/01
Mercury	0.336	mg/kg J		7471	10/15/01
Manganese	520	mg/kg	10	6010B	10/22/01
Molybdenum	<8.0*	mg/kg	10	6010B	10/22/01
Nickel	<10*	mg/kg U	10	6010B	10/22/01
Lead	76.5	mg/kg	10	6010B	10/22/01
Antimony	<5.0*	mg/kg UJ	10	6010B	10/22/01
Selenium	<10*	mg/kg U	10	6010B	10/22/01
Strontium	73.9	mg/kg J	10	6010B	10/22/01
Thallium	<10*	mg/kg U	10	6010B	10/22/01
Vanadium	71.6	mg/kg	10	6010B	10/22/01
Zinc	340	mg/kg	10	6010B	10/22/01

*Elevated detection limit due to matrix interference.
SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer
Date 10/24/01
10/24/01 11:02

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Certificate: AR AR0538
Phone: (208)784-1258 ■ Fax: (208)783-0891

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-8DS KS 11/15/01 SEE TEL. CONV. RECORD WITH K. GRAY (SVL)
Sample Collected: 10/05/01 15:55
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99859
SAMPLE: 279609
% Solids: 99.8%
Matrix: SOIL

Determination	Result	Units	Dilution	Method	Analyzed
pH Paste	7.90			ASA M9	10/18/01
Tin	18.0	mg/kg	10	6010B	10/22/01
Silver	49.9	mg/kg	10	6010B	10/22/01
Aluminum	11100	mg/kg	10	6010B	10/22/01
Arsenic	1440	mg/kg	10	6010B	10/22/01
Boron	<40*	mg/kg U	10	6010B	10/22/01
Barium	113	mg/kg	10	6010B	10/22/01
Beryllium	<2.0*	mg/kg U	10	6010B	10/22/01
Cadmium	10.0	mg/kg	10	6010B	10/22/01
Cobalt	13.9	mg/kg	10	6010B	10/22/01
Chromium	12.7	mg/kg	10	6010B	10/22/01
Copper	33700	mg/kg	100	6010B	10/23/01
Iron	58200	mg/kg	10	6010B	10/22/01
Mercury	2.52	mg/kg J	10	7471	10/15/01
Manganese	609	mg/kg	10	6010B	10/22/01
Molybdenum	<8.0*	mg/kg U	10	6010B	10/22/01
Nickel	14.0	mg/kg	10	6010B	10/22/01
Lead	683	mg/kg	10	6010B	10/22/01
Antimony	20.3	mg/kg J	10	6010B	10/22/01
Selenium	<10*	mg/kg U	10	6010B	10/22/01
Strontium	50.4	mg/kg J	10	6010B	10/22/01
Thallium	<10*	mg/kg U	10	6010B	10/22/01
Vanadium	49.3	mg/kg	10	6010B	10/22/01
Zinc	1480	mg/kg	10	6010B	10/22/01

*Elevated detection limit due to matrix interference.
SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer
Date 10/24/01
10/24/01 11:02

SVL ANALYTICAL, INC.
One Government Gulch # P.O. Box 929 # Kellogg, Idaho 83837-0929 # Certificate: AK AK0538
Phone: (208)784-1258 # Fax: (208)783-0891

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-9S
Sample Collected: 10/05/01 17:50
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279612
% Solids: 99.7%
Matrix: SOIL

Determination	Result	Units	Dilution	Method	Analyzed
pH Paste	6.61			ASA M9	10/18/01
Tin	11.0	mg/kg	10	6010B	10/22/01
Silver	27.4	mg/kg	10	6010B	10/22/01
Aluminum	13200	mg/kg	10	6010B	10/22/01
Arsenic	834	mg/kg	10	6010B	10/22/01
Boron	<40*	mg/kg U	10	6010B	10/22/01
Barium	98.0	mg/kg	10	6010B	10/22/01
Beryllium	<2.0*	mg/kg U	10	6010B	10/22/01
Cadmium	7.3	mg/kg	10	6010B	10/22/01
Cobalt	13.7	mg/kg	10	6010B	10/22/01
Chromium	18.6	mg/kg	10	6010B	10/22/01
Copper	17200	mg/kg	10	6010B	10/22/01
Iron	71400	mg/kg	10	6010B	10/23/01
Mercury	1.36	mg/kg J		6010B	10/22/01
Manganese	530	mg/kg	10	7471	10/15/01
Molybdenum	<8.0*	mg/kg U	10	6010B	10/22/01
Nickel	<10*	mg/kg U	10	6010B	10/22/01
Lead	388	mg/kg	10	6010B	10/22/01
Antimony	12.6	mg/kg J	10	6010B	10/22/01
Selenium	<10*	mg/kg U	10	6010B	10/22/01
Strontium	68.4	mg/kg J	10	6010B	10/22/01
Thallium	<10*	mg/kg U	10	6010B	10/22/01
Vanadium	59.5	mg/kg	10	6010B	10/22/01
Zinc	1030	mg/kg	10	6010B	10/22/01

*Elevated detection limit due to matrix interference.
SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer
Date 10/24/01
10/24/01 11:03

SVL ANALYTICAL, INC.
One Government Gulch ▪ P.O. Box 929 ▪ Kellogg, Idaho 83837-0929 ▪ Certificate: AZ A50538 Phone: (208)784-1258 ▪ Fax: (208)783-0891

CLIENT : GOLDER ASSOCIATES
PROJECT: SUPERIOR
CLIENT SAMPLE ID: GAI-9D
Sample Collected: 10/05/01 18:00
Sample Receipt : 10/09/01
Date of Report : 10/23/01

SVL JOB: 99559
SAMPLE: 279613
% Solids: 99.0%
Matrix: SOIL

Determination	Result	Units	Q	Dilution	Method	Analyzed
pH Paste	5.92				ASA M9	10/18/01
Tin	~~3.4~~ ~~7.5~~ TNG Stet	mg/kg	U		6010B	10/22/01
Silver	1.7	mg/kg			6010B	10/22/01
Aluminum	20900	mg/kg			6010B	10/22/01
Arsenic	160	mg/kg			6010B	10/22/01
Boron	<4.0	mg/kg	U		6010B	10/22/01
Barium	154	mg/kg			6010B	10/22/01
Beryllium	0.7	mg/kg			6010B	10/22/01
Cadmium	2.8	mg/kg			6010B	10/22/01
Cobalt	10.0	mg/kg			6010B	10/22/01
Chromium	17.1	mg/kg			6010B	10/22/01
Copper	1910	mg/kg		10	6010B	10/23/01
Iron	25800	mg/kg			6010B	10/22/01
Mercury	0.069	mg/kg	J		7471	10/15/01
Manganese	236	mg/kg			6010B	10/22/01
Molybdenum	1.2	mg/kg			6010B	10/22/01
Nickel	10.3	mg/kg			6010B	10/22/01
Lead	27.0	mg/kg			6010B	10/22/01
Antimony	2.1	mg/kg	J		6010B	10/22/01
Selenium	<1.0	mg/kg	U		6010B	10/22/01
Strontium	134	mg/kg	J		6010B	10/22/01
Thallium	<1.0	mg/kg	U		6010B	10/22/01
Vanadium	57.2	mg/kg			6010B	10/22/01
Zinc	204	mg/kg			6010B	10/22/01

SIEVED -60 MESH

Reviewed By: Kirby Gray
Kirby Gray, Project Officer

Date 10/24/01
10/24/01 11:03

Attachment 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

Received: 10/24/01 11:35AM; +2087830891 -> GOLDER ASSOCIATES; Page 2

OCT-24-01 10:35 From:SVL ANALYTICAL +2087830891 T-548 P.02 Job-76

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: KENNECOTT/GOLDER
Contact: KENT JOHNEJACK
Address: 4730 N. ORACLE #210
TUCSON AZ 85705
Phone Number: (520) 888-8818
FAX Number: (520) 888-8817

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition
PO#:
Project Name: SUPERIOR
013-2522

Table 1. – Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

FOR SVL USE ONLY
SVL JOB #

Samplers Signature: [signature]

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Analyses Required	Comments
1. GAI-7S	10/05/01	1510	KJ/JP	3	1	–								
2. GAI-7D	10/05/01	1520	KJ/JP	3	1	–								
3. GAI-11S	10/05/01	1520	KJ/JP	3	1	–								
4. GAI-8S	10/05/01	1545	KJ/JP	3	1	–								
5. GAI-8D	10/05/01	1555	KJ/JP	3	1	–							SEE ATTACHED SCOPE OF WORK	
6. GAI-1S	10/05/01	1625	KJ/JP	3	1	–								
7. GAI-1D	10/05/01	1635	KJ/JP	3	1	–								
8. GAI-9S	10/05/01	1750	KJ/JP	3	1	–								
9. GAI-9D	10/05/01	1800	KJ/JP	3	1	–								
10.														

Relinquished by: Keith Johnson [signature] Date: 10/08/01 Time: 1200 ABOUT Received by: [signature] Date: 10/10/01 Time: 11:00
Relinquished by: Date: Time: Received by: Date: Time:

* Sample Reject: [ ] Return [ ] Dispose [X] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SVL-COC 12/95

26

CHAIN OF CUSTODY RECORD

Client: KENNECOTT/GOODER
Contact: KENT JOHNSTACK
Address: 4730 N. ORACLE #210
TUCSON, AZ 85705
Phone Number: (520) 888-8818
FAX Number: (520) 888-8817

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
3) Designate Sample Reject Disposition

PO#:
Project Name: SUPERIOR
013-2522.3

Table I. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) _____

FOR SVL USE ONLY
SVL JOB # 99557

Samplers Signature: Kent R Johnson

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection: Date	Collection: Time	Misc: Collected by: (Init.)	Misc: Matrix Type From Table I	Misc: No. of Containers	Misc: Sample Filtered ? Y/N	Preservative(s): Unpreserved (Ice Only)	Preservative(s): HNO3	Preservative(s): HCL	Preservative(s): H2SO4	Preservative(s): NAOH	Preservative(s): Other (Specify)	Analyses Required	Comments
1. GAI-5S	10/05/01	0930	KJ/JP	3	1	-								
2. GAI-5D	10/05/01	0940	KJ/JP	3	1	-								
3. GAI-4S	10/05/01	1050	KJ/JP	3	1	-								
4. GAI-4D	10/05/01	1105	KJ/JP	3	1	-								
5. GAI-3S	10/05/01	1155	KJ/JP	3	1	-								
6. GAI-3D	10/05/01	1205	KJ/JP	3	1	-								
7. GAI-2S	10/05/01	1240	KJ/JP	3	1	-								
8. GAI-2D	10/05/01	1255	KJ/JP	3	1	-								
9. GAI-6S	10/05/01	1430	KJ/JP	3	1	-								
10. GAI-6D	10/05/01	1440	KJ/JP	3	1	-								

Relinquished by: Kent R Johnson
Date: 10/08/01
Time: 12:00 AM/PM
Received by:
Date: 10/09
Time: 11:00

Relinquished by:
Date:
Time:
Received by:
Date:
Time:

* Sample Reject: [ ] Return [ ] Dispose [X] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SVL-COC 12/95

Received: 10/23/01 4:26PM; +2087830891 -> GOLDER ASSOCIATES; Page 14
OCT-23-01 15:26 From:SVL ANALYTICAL +2087830891 T-638 P.14/15 Job-740

24

CONFIRMATION REPORT - MEMORY SEND

Time : OCT-10-01 13:04
Fax number: +2087830891
Name : SVL ANALYTICAL

Job : 356

Date : OCT-10 12:56

To : 915208888817

Doc. pages : 01

Start time : OCT-10 13:03

End time : OCT-10 13:04

Pages sent : 01

Job:356 *** SEND SUCCESSFUL ***

SVL ANALYTICAL, INC.
One Government Gulch - Kellogg, ID 83837-0929

SAMPLE RECEIPT CONFIRMATION

SVL JOB No: 95559
Received: 10/09/01
Expected Due date: 10/23/01

CLIENT: [illegible]
GOLDER ASSOCIATES
[illegible]
TUCSON AZ [illegible]
FAX: (520)888-8817

SVL#	Client ID	Sampled	Time	Received	Sample Comments
275595	[illegible]	[illegible]	[illegible]	[illegible]	
275596	[illegible]	[illegible]	[illegible]	[illegible]	
275597	[illegible]	[illegible]	[illegible]	[illegible]	
275598	[illegible]	[illegible]	[illegible]	[illegible]	
275599	[illegible]	[illegible]	[illegible]	[illegible]	
275600	[illegible]	[illegible]	[illegible]	[illegible]	
275601	[illegible]	[illegible]	[illegible]	[illegible]	
275602	[illegible]	[illegible]	[illegible]	[illegible]	
275603	[illegible]	[illegible]	[illegible]	[illegible]	
275604	[illegible]	[illegible]	[illegible]	[illegible]	
275605	[illegible]	[illegible]	[illegible]	[illegible]	
275606	[illegible]	[illegible]	[illegible]	[illegible]	
275607	[illegible]	[illegible]	[illegible]	[illegible]	
275608	[illegible]	[illegible]	[illegible]	[illegible]	
275609	[illegible]	[illegible]	[illegible]	[illegible]	
275610	[illegible]	[illegible]	[illegible]	[illegible]	
275611	[illegible]	[illegible]	[illegible]	[illegible]	
275612	[illegible]	[illegible]	[illegible]	[illegible]	
275613	[illegible]	[illegible]	[illegible]	[illegible]	

ADDITIONAL COMMENTS FOR JOB: Sample Cooler temp: [illegible]

( ) These samples will be [illegible] 45 days after job completion.
[X] These samples will be [illegible] 45 days, then you will receive a letter requesting disposal options.

Please contact Carol [illegible] ([illegible]) if you have questions regarding the receipt of these samples. 10/10/01 12:20

VL ANALYTICAL, INC.

Quality Control Report

Part I Prep Blank and Laboratory Control Sample

lent :GOMPER ASSOCIATES SVL JOB No. :99559

Analyte	Method	Matrix	Units	Prep Blank	True	LCS	Found	LCS %R	Analysis Date
Silver	6010B	SOIL	mg/kg	<0.5	184		214	116.3	10/23/01
Aluminum	6010B	SOIL	mg/kg	<2.0	5940		6690	112.6	10/22/01
Arsenic	6010B	SOIL	mg/kg	<1.0	170		194	114.1	10/22/01
Boron	6010B	SOIL	mg/kg	<4.0	58.5		63.2	108.0	10/22/01
Barium	6010B	SOIL	mg/kg	<0.2	151		169	111.9	10/22/01
Beryllium	6010B	SOIL	mg/kg	<0.2	62.2		73.2	117.7	10/22/01
Cadmium	6010B	SOIL	mg/kg	<0.2	184		213	115.8	10/22/01
Cobalt	6010B	SOIL	mg/kg	<0.6	49.4		57.1	115.6	10/22/01
Chromium	6010B	SOIL	mg/kg	<0.6	111		124	111.7	10/22/01
Copper	6010B	SOIL	mg/kg	<0.3	86.0		98.6	114.7	10/22/01
Iron	6010B	SOIL	mg/kg	<2.0	11100		11600	104.5	10/22/01
Manganese	6010B	SOIL	mg/kg	<0.2	359		402	112.0	10/22/01
Molybdenum	6010B	SOIL	mg/kg	<0.8	83.4		94.1	112.8	10/23/01
Nickel	6010B	SOIL	mg/kg	<1.0	127		141	111.0	10/22/01
Lead	6010B	SOIL	mg/kg	<0.5	106		116	109.4	10/22/01
Antimony	6010B	SOIL	mg/kg	<0.5	79.9		67.7	84.7	10/22/01
Selenium	6010B	SOIL	mg/kg	<1.0	85.7		97.9	114.2	10/22/01
Tin	6010B	SOIL	mg/kg	1.5	92.6		95.7	103.3	10/22/01
Strontium	6010B	SOIL	mg/kg	<0.5	169		205	121.3	10/22/01
Thallium	6010B	SOIL	mg/kg	<1.0	145		163	112.4	10/22/01
Vanadium	6010B	SOIL	mg/kg	<0.5	77.2		84.3	109.2	10/22/01
Zinc	6010B	SOIL	mg/kg	<0.5	371		436	117.5	10/22/01
Mercury	7471	SOIL	mg/kg	<0.033	29.6		35.3	119.3	10/15/01
pH Paste	ASA M9	SOIL		N/A	8.60		8.44	98.1	10/18/01

LEGEND:

LCS = Laboratory Control Sample LCS %R = LCS Percent Recovery N/A = Not Applicable

SVL ANALYTICAL, INC.

Quality Control Report

Part II Duplicate and Spike Analysis

Client :GOLDER ASSOCIATES

Test	Method	Matrix	QC SAMPLE ID Units	Result	Duplicate or MSD Found		RPD%	Matrix Spike Result	SPK ADD		%R	SVL JOB No :99559 Analysis Date
lg	6010B	SOIL	1 mg/kg	14.4	118	M	5.2	112	100		97.6	10/22/01
ug	6010B	SOIL	2 mg/kg	123	N/A		N/A	121	100		-2.0	10/22/01
lg	6010B	SOIL	2 mg/kg	123	N/A		N/A	988	1000	A	86.5	10/22/01
il	6010B	SOIL	1 mg/kg	11700	17000	M	0.0	17000	100		R >4S	10/22/01
il	6010B	SOIL	2 mg/kg	9310	N/A		N/A	15400	100		R >4S	10/22/01
ls	6010B	SOIL	1 mg/kg	448	579	M	6.2	544	100		96.0	10/22/01
ls	6010B	SOIL	2 mg/kg	3050	N/A		N/A	3850	100		R >4S	10/22/01
b	6010B	SOIL	1 mg/kg	<40*	94.0	M	0.0	94.0	100		94.0	10/22/01
b	6010B	SOIL	2 mg/kg	<40*	N/A		N/A	92.0	100		92.0	10/22/01
.a	6010B	SOIL	1 mg/kg	83.3	191	M	4.3	183	100		99.7	10/22/01
.a	6010B	SOIL	2 mg/kg	91.5	N/A		N/A	207	100		115.5	10/22/01
e	6010B	SOIL	1 mg/kg	<2.0*	99.4	M	0.6	100	100		100.0	10/22/01
e	6010B	SOIL	2 mg/kg	<2.0*	N/A		N/A	98.1	100		98.1	10/22/01
d	6010B	SOIL	1 mg/kg	4.8	115	M	2.6	112	100		107.2	10/22/01
d	6010B	SOIL	2 mg/kg	14.6	N/A		N/A	124	100		109.4	10/22/01
o	6010B	SOIL	1 mg/kg	11.1	117	M	1.7	115	100		103.9	10/22/01
o	6010B	SOIL	2 mg/kg	21.8	N/A		N/A	126	100		104.2	10/22/01
r	6010B	SOIL	1 mg/kg	12.8	113	M	6.8	121	100		108.2	10/22/01
r	6010B	SOIL	2 mg/kg	13.6	N/A		N/A	111	100		97.4	10/22/01
u	6010B	SOIL	1 mg/kg	6590	6910	M	1.2	6830	100		R >4S	10/23/01
u	6010B	SOIL	2 mg/kg	99600	N/A		N/A	104000	100		R >4S	10/23/01
a	6010B	SOIL	1 mg/kg	81100	81400	M	1.2	80400	1000		R >4S	10/22/01
a	6010B	SOIL	2 mg/kg	84100	N/A		N/A	91700	1000		R >4S	10/22/01
n	6010B	SOIL	1 mg/kg	465	593	M	0.8	588	100		123.0	10/22/01
n	6010B	SOIL	2 mg/kg	768	N/A		N/A	988	100		R >4S	10/22/01
c	6010B	SOIL	1 mg/kg	<8.0*	96.6	M	1.6	98.2	100		98.2	10/22/01
p	6010B	SOIL	2 mg/kg	<8.0*	N/A		N/A	102	100		102.0	10/22/01
i	6010B	SOIL	1 mg/kg	<10*	97.0	M	1.0	96.0	100		96.0	10/22/01
i	6010B	SOIL	2 mg/kg	24.0	N/A		N/A	125	100		101.0	10/22/01
)	6010B	SOIL	1 mg/kg	207	313	M	2.6	305	100		98.0	10/22/01
)	6010B	SOIL	2 mg/kg	1280	N/A		N/A	1580	100		R >4S	10/22/01
)	6010B	SOIL	1 mg/kg	6.1	57.7	M	2.9	59.4	100		53.3	10/22/01
)	6010B	SOIL	1 mg/kg	6.1	N/A		N/A	945	1000	A	93.9	10/22/01
)	6010B	SOIL	2 mg/kg	43.1	N/A		N/A	123	100		79.9	10/22/01
)	6010B	SOIL	1 mg/kg	<10*	91.0	M	2.2	93.0	100		93.0	10/22/01
)	6010B	SOIL	2 mg/kg	<10*	N/A		N/A	99.0	100		99.0	10/22/01
l	6010B	SOIL	1 mg/kg	<10*	<10*		UDL	<10*	250		0.0	10/22/01
l	6010B	SOIL	1 mg/kg	<10*	N/A		N/A	2250	2500	A	90.0	10/22/01
l	6010B	SOIL	2 mg/kg	32.0	N/A		N/A	37.0	250		2.0	10/22/01
l	6010B	SOIL	2 mg/kg	32.0	N/A		N/A	2510	2500	A	99.1	10/22/01
-	6010B	SOIL	1 mg/kg	58.2	353	M	1.4	348	250		115.9	10/22/01
-	6010B	SOIL	2 mg/kg	42.6	N/A		N/A	334	250		116.6	10/22/01
.	6010B	SOIL	1 mg/kg	<10*	98.0	M	2.1	96.0	100		96.0	10/22/01
.	6010B	SOIL	2 mg/kg	<10*	N/A		N/A	92.0	100		92.0	10/22/01

LEGEND:

RPD = (|SAM - DUP|/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference required dilution.

RPD = (|SPK - MSD|/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

XXX ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC Sample 1: SVL SAM No.: 279595 Client Sample ID: GAI-5S

QC Sample 2: SVL SAM No.: 279605 Client Sample ID: GAI-7S

10/23/01 15:43

VL ANALYTICAL, INC.

Quality Control Report

Part II Duplicate and Spike Analysis

(nt :GOLDER ASSOCIATES SVL JOB No :99559

Test	Method	Matrix	QC SAMPLE ID	Units	Result	Duplicate or MSD Found		RPD%	Matrix Spike Result	SPK ADD	%R	Analysis Date
	6010B	SOIL	1	mg/kg	58.0	155	M	2.6	151	100	93.0	10/22/01
	6010B	SOIL	2	mg/kg	52.2	N/A		N/A	148	100	95.8	10/22/01
n	6010B	SOIL	1	mg/kg	563	700	M	3.6	675	100	112.0	10/22/01
n	6010B	SOIL	2	mg/kg	2870	N/A		N/A	3090	100	R >4S	10/22/01
g	7471	SOIL	1	mg/kg	0.542	0.504		7.3	0.652	0.167	65.9	10/15/01
g	7471	SOIL	2	mg/kg	5.71	N/A		N/A	5.88	0.167	101.8	10/15/01
Sol.	999	SOIL	1	%	99.8	99.5		0.2	N/A	N/A	N/A	10/11/01

LEGEND:

PD% = (|SAM - DUP|/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. >Result or >Found; Interferance required dilution.
PD% = (|SPK - MSD|/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.
PIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analysed; E > 4R = Result more than 4X the Spike Added
QC Sample 1: SVL SAM No.: 279595 Client Sample ID: GAI-5S
QC Sample 2: SVL SAM No.: 279605 Client Sample ID: GAI-7S

ORIG. Result — Duplic. Analyt. Result

RPD = 7.3

; For Hg ONLY, All other RPD results from MS/MSD comparison.

TMB

INORGANIC DATA ASSESSMENT SUMMARY

INORGANIC DATA ASSESSMENT SUMMARY

PROJECT: 013-2522.3	SITE: SUPERIOR MINE
LABORATORY: SVL Analytical	SDG: 99559
SAMPLES/MATRIX/ANALYSES: GAI-1S, -1D, -2S, -2D, -3S, -3D, GAI-4S, -4D, -5S, -5D, -6S, -6D, -7S, -7D, -8S, -8D, GAI-9S, -9D, -11S, -11D / SOIL, SEDIMENT / Metals	

DATA ASSESSMENT SUMMARY

REVIEW ITEM	ICP 6010	AA	HG 7471	CYANIDE	OTHER
1. Data completeness	O		O		
2. Holding Times	O		O		
3. Calibration	—		—		
4. Blanks	⊗		O		
5. ICS	—		—		
6. LCS	⊗		O		
7. Duplicate RPD	O		O		
8. Spike Recovery	⊗		O		
9. MSA	—		—		
10. Other QC	O		O		
11. Field Duplicates	O		O		
12. Result Verification	O		O		
13. Overall Assessment	O		O		

O = Data had no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems but do not affect data.

Comments/Qualified Results:

GAI-7S, GAI-11S (Field Duplic.)

Validated by: [signature] Date: Nov. 8, 2001

Reviewed by: Date:

INORGANIC DATA ASSESSMENT SUMMARY

Acceptable Yes ✓ No ___

1. Data package completeness (check if present) . . . . . ✓ ___

___Case narrative
✓ Chain of custody
✓ Sample Results
___ICV/CCV Results
✓ Blank Results
___ICP Interference Check Results
✓ Spike Recovery Results
✓ Duplicate Results
✓ LCS Results
___Standard Addition Results
___ICP Serial Dilution

✓ Instrument Det. Limits
___ICP Correction Factors
___ICP Linear Ranges
___Preparation Logs
___Analysis Run Logs
___ICP Raw Data
___GFAA Raw Data
___Hg Raw Data
___Cyanide Raw Data
___Other_____

Comments/Qualified Results:_____

2. Holding times (check all that apply) . . . . . ✓ ___

✓ ICP/GFAA metals completed in <6 mos from collection
✓ Mercury analyzed in <28 days from collection
___Cyanide completed in 14 days from collection

	Collected	Prep	Analysis	DAYS
(M)	10-05		10-22,23	17-18
(Hg)	10-05		10-15	10

Comments/Qualified Results:_____

3. Calibrations (check all that apply) . . . . . ___NA___

___ICV/CCV %R for ICP/AA, 90%-110%, results acceptable
___ICV/CCV %R for ICP/AA, 75%-89% or 111%-125%, results estimated (J/UJ)
___ICV/CCV %R for ICP/AA, <75% or >125%, reject positive results (R)
___ICV/CCV %R 80-120 for Hg, results acceptable
___ICV/CCV %R for Hg, 65%-79% or 121%-135%, results estimated (J/UJ)
___ICV/CCV %R for Hg, <65% or >135%, reject positive results (R)
___ICV/CCV %R 85-115 for Cyanide, results acceptable
___ICV/CCV %R 70-84% or 116-130%, results estimated (J/UJ)
___ICV/CCV %R <70% or >130%, reject positive results (R)

Comments/Qualified Results: Not provided, Not evaluated

Acceptable
Yes No

4. Blanks (check all that apply) . . . . . ___ ✓

NA ___ Detects reported in ICB/CCB, list: _____

✓ Detects in preparation blanks, list: Sn

NA ___ Detects in field blanks, list: _____

Qualify as undetected (U) all sample concentrations ≤5X any associated blank concentrations.

Comments/Qualified Results: Sn Results qualif. (U) for results < 7.5 mg/Kg ; GAI-5D, -6D, -4D, -3D, -2D, -1D, -7D, and -9D.

5. Interference Checks (check all that apply) . . . . . NA

___ ICS A/B Recoveries Acceptable
___ Al, Ca, Fe, Mg sample concentrations >ICS concentrations
___ ICS %R >120%, results >IDL estimated (J)
___ ICS %R 50-79%, results >IDL estimated (J)
___ ICS %R 50-79%, results <IDL estimated (UJ)
___ ICS %R <50%, results >IDL and <IDL rejected (R/UR)

Comments/Qualified Results: Not provided, Not evaluated

6. Laboratory Control Samples (check all that apply) . . . . . ___ ✓

✓ LCS %R 80-120
✓ LCS %R 50-79% or >120%, results >IDL estimated (J) Strontium only, Note①
___ LCS %R 50-79% and results <IDL estimated (UJ)
___ LCS %R <50% and all results rejected (R/UR)

Comments/Qualified Results: Sr detects qualif. (J). <All Samples>

Acceptable
Yes No

7. Duplicate (check all that apply) . . . . . ✓ ___

✓ Duplicate RPD ≤20% for waters (≤35% for soils) for results >5X CRDL
✓ Duplicate range is within ±CRDL (±2xCRDL for soils) for results <5X CRDL

Comments/Qualified Results: MS/MSD RPD evaluated for GAI-5S

8. Spike Recovery (check all that apply) . . . . . ___ ✓

✓ Spike %R with 75-125%
✓ Spike %R 30-74%, >125%, results >IDL estimated (J)
✓ Spike %R 30-74% results <IDL estimated (UJ)
___ Spike %R <30%, results <IDL rejected (UR)
___ Field blank used for spike analysis

Comments/Qualified Results: Low Recov: Hg 66%, Sb 53% => assoc. results qualif. (J/UJ)

9. GFAA Performance . . . . . ___ NA ___

___ Duplicate injection RSD <20%
___ Duplicate injection RSD >20%, results >CRDL estimated (J)
___ Analytical spike %R 85-115%
___ Analytical spike %R 40-85%, results >IDL estimated (J)
___ Anlaytical spike %R 10-40%, results <IDL estimated (UJ)
___ Analytical spike %R <10%, results <IDL rejected (R)

Comments/Qualified Results: Not provided, Not performed.

Acceptable Yes / No

10. Other QC . . . . . ✓ ~~NA~~ ___

Comments/Qualified Results: ~~Not provided, Not evaluated~~ MRS

POST DIGEST SPIKE Recoveries acceptable.

11. Field Duplicates . . . . . ✓ ___

✓ Field duplicate RPD ≤20% (≤35% for soils)

Comments/Qualified Results: ___

12. Result Verification . . . . . NA

___ All results supported in raw data

Comments/Qualified Results: Raw data not provided, Not evaluated.

13. Overall Assessment . . . . . ✓ ___

Comments/Qualified Results: ___

Privileged and Confidential

TABLE A-5.1

SAMPLES EXCEEDING MAXIMUM HOLDING TIME

SDG: 99559		Project: 013-2376.3		Date: 11-08-01		Page 1 of 1	
Comments:							
Field Sample ID	Analysis Type	Date Sampled	Date Prepared	Date Analyzed	Prep. MHT Days	Analy. MHT Days	Qualifier
GAI-01S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-01D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-02S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-02D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-03S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-03D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-04S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-04D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-05S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-05D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-06S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-06D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-07S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-07D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-08S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-08D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-09S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-09D	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None
GAI-11S	Metals, Hg	10/05/01	10/18/01	10/18-23/01, 10/15/01	13, 10	18, 10	None

Privileged and Confidential

TABLE A-5.2

FIELD DUPLICATE SUMMARY

SDG: 99559	PROJECT: 013-2376.3	DATE: 11-08-01	PAGE 1 OF 1
COMMENT: FIELD SAMPLE ID GAI-07S; BLIND DUPLICATE ID GAI-11S			
COMPOUND/ANALYTE	SAMPLE RESULT GAI-07S	DUPLICATE RESULT GAI-11S	RELATIVE PERCENT DIFFERENCE (RPD)
	METALS (mg/Kg):		(%)
PH Pst	6.3	6.02	-4.5
Sn	32	35	9.0
Ag	123	124	0.8
Al	9310	9400	1.0
As	3050	4190	31.5
B	<40	<40	0.0
Ba	91.5	99.2	8.1
Be	<2	<2	0.0
Cd	14.6	16.8	14.0
Co	21.8	22.4	2.7
Cr	13.6	11.6	-15.9
Cu	99600	98300	-1.3
Fe	84100	79400	-5.7
Hg	5.71	7.82	31.2
Mn	768	884	14.0
Mo	<8	<8	0.0
Ni	24	28	15.4
Pb	1280	1520	17.1
Sb	43.1	54.6	23.5
Se	<10	<10	0.0
Sr	42.6	43.5	2.1
Tl	<10	<10	0.0
V	52.2	43.3	-18.6
Zn	2870	2960	3.1

Appendix A3
Quality Control Summary Report for 1998 B&C Dataset
(CD- Resolution Copper Mining, LLC)

Innovative Technical Solutions, Inc.

November 6, 2007

Dr. Casey McKeon
Environmental Supervisor
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85272

RE: QUALITY CONTROL SUMMARY REPORT
HUMAN HEALTH RISK ASSESSMENT
BHP COPPER SUPERIOR OPERATIONS

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) is pleased to present this Quality Control Summary Report (QCSR) for Resolution Copper Mining's (RCM) Human Health Risk Assessment for the BHP Copper Superior Operations. As requested by Golder Associates, Inc., the QCSR summarizes the data validation report submitted by Quality by Design of Hilo, Hi based on the U.S. Environmental Protection Agency (EPA) *National Functional Guidelines for Inorganic Data Review*, 2004; the Quality Assurance Project Plan (QAPP), Section 5.0, Volume 3 – Appendices, *Aquifer Protection Permit Application*, West Plant Site, Superior Mine, Superior, Arizona, 2005; and by using criteria in the referenced method.

If you have any questions, please feel free to contact me at 480-706-6488, extension 3396.

Sincerely,

Evelyn Dawson
Senior Chemist

Encl.

Cc: Orestes Morfin, Golder Associates, Inc.

1501 West Fountainhead Parkway, Suite 360
Tempe, AZ 85282

(480) 706-6488
fax (480) 704-2952
www.itsi.com

Quality Control Summary Report
Resolution Copper Mining LLC
Human Health Risk Assessment
BHP Copper Superior Operations
Superior, Arizona

Prepared for:

Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85272

Prepared by:

Innovative Technical Solutions, Inc.
1501 West Fountainhead Parkway, Suite 360
Tempe, Arizona 85282

November 2007

Quality Control Summary Report
Resolution Copper Mining LLC
Human Health Risk Assessment

BHP Copper Superior Operations
Superior, Arizona

Prepared for:

Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85272

Prepared by:

Innovative Technical Solutions, Inc.
1501 West Fountainhead Parkway, Suite 360
Tempe, Arizona 85282

November 2007

Peggy Cota
Project Chemist

Evelyn Dawson
Project Manager

TABLE OF CONTENTS

LIST OF TABLES AND APPENDICES

TABLE

APPENDIX

LIST OF ACRONYMS AND ABBREVIATIONS

B&C	Brown and Caldwell
CD	compact disc
DQO	data quality objectives
DMA	Del Mar Analytical
DVR	Data Validation Report
EPA	U.S. Environmental Protection Agency
ICP	inductively coupled plasma
ITSI	Innovative Technical Solutions, Inc.
GFAA	graphite furnace atomic absorption
LCS	laboratory control sample
MS/MSD	matrix spike/matrix spike duplicate
QA	quality assurance
QAP	Quality Assurance Plan
QAPP	Quality Assurance Project Plan
QBD	Quality by Design
QC	quality control
QCSR	Quality Control Summary Report
QRT	Qualified Results Table
RL	reporting limit
RPD	relative percent difference
SDG	Sample Delivery Group

1.0 INTRODUCTION

Innovative Technical Solutions, Inc. (ITSI) prepared this Quality Control Summary Report (QCSR) for Resolution Copper Mining LLC to reconcile the data with the current project data quality objectives (DQOs) for comparability and to summarize the overall quality of the past data. The sampling events included with this report are a subset of the total project samples and were collected and analyzed in the first quarter of 1998. The DQOs are specified in the Quality Assurance Project Plan (QAPP), Section 5.0, Volume 3 - Appendices, *Aquifer Protection Permit Application*, West Plant Site, Superior Mine, Superior Arizona, 2005. Although this QAPP was not in effect at the time the samples were collected and analyzed, it was used to ensure the data quality results can be used to obtain the DQO established for the project and to identify the need for a more rigorous data review for risk assessment if any. The DQO is to evaluate potential impacts of historical mining operations.

Table 1 of this report presents a list of the samples contained in this QCSR for the purpose of meeting the DQO. It also contains a cross reference to the laboratory identifications.

2.0 ANALYTICAL PROGRAM

Del Mar Analytical (DMA) of Phoenix, Arizona, was selected as the primary analytical laboratory. The laboratory provided a modified Level IV data deliverable on which a Level III data review (data verification) with a cursory review of raw data was completed. The laboratory data deliverable including quality control (QC) summaries are presented on compact disc (CD) as Appendix A.

Quality by Design (QBD) of Hilo, Hawaii, was selected as the primary data validators to review the laboratory data deliverables. The Level III Data Validation Report (DVR) is attached as Appendix B.

Soil sample analyses were conducted in accordance with the requirements specified in the following guidance documents.

- Test Methods for Evaluating Solid Waste, SW-846 Physical/Chemical Methods U.S. Environmental Protection Agency (EPA), 1996
- BHP Copper Superior Operation Quality Assurance Project Plan (QAPP), Brown and Caldwell (B&C), 1998

Specifically, the metals and analytical methods used for this sampling event are listed below.

- Inductively coupled plasma (ICP) copper and arsenic by EPA Method 6010A
- Graphite furnace atomic absorption (GFAA) arsenic by EPA Method 7060A

Data verification was performed by QBD on the samples cross referenced in Table 1. Analytical data were reviewed and verified for all test methods according to the procedures specified in the following documents, as applicable.

- BHP Copper Superior Operations QAPP (B&C, 1998)
- Test Methods for Evaluating Solid Waste, SW-846 Physical/Chemical Methods (EPA, 1996)
- EPA Functional Guidelines for Evaluating Inorganics Analyses, December 1994

Detailed data verification procedures are specified in the BHP Copper Superior Operations QAPP (B&C, 1998). The following analytical QC summaries were evaluated and used as the basis for qualifying data.

- Holding time
- Initial calibration verification
- Continuing calibration verification
- Method blank and instrument contamination
- Laboratory control sample (LCS) accuracy
- Matrix spike/matrix spike duplicate (MS/MSD) accuracy and precision
- Field duplicate precision
- Analyte quantitation

A Level III DVR was produced by QBD. The QBD DVR is included as Appendix B. It should be noted that the QDB DVR includes samples which are not part of the scope this QCSR. ITSI has reviewed the QBD DVR and associated Qualified Results Table (QRT). Data from the QBD report applicable to this QCSR are incorporated in Tables 2 and 3.

ITSI performed verification and cursory raw data review on two additional Sample Delivery Groups (SDGs) not included in QBD's data verification. Those SDGs were reviewed by ITSI based on the most current version of the documents listed above. There were no anomalies found that resulted in qualification of the data. No DVR was produced; however, the summary statistics and conclusions are included in this QCSR.

2.1 QUALIFIED RESULTS

The following qualifiers have been applied as appropriate to the data.

- "J" denotes the analyte was positively identified; the value is an estimation.
- "U" denotes the analyte was analyzed for but not detected. The associated numerical value is at or below the reporting limit (RL).
- "UJ" denotes the associated quantification limit is an estimate.
- "R" denotes the data are unusable due to deficiencies in the ability to analyze the sample and meet QC criteria.

A qualifier may be applied to a result for more than one reason. For example, an analysis that exceeded the allowed holding time and qualified as "J" may also be qualified due to an identified problem with the instrument calibration.

The following sections discuss the quality of the data and reasons for qualification. Significant data quality issues, if any, are discussed in Section 3.0.

2.2 SAMPLE SHIPMENT AND STORAGE

All samples were hand delivered to the laboratory within a few days after collection in the field. Upon receipt by the laboratory, samples were immediately entered into the laboratory's data system and properly stored. No results were qualified due to improper sample shipment and/or storage for this event.

2.3 HOLDING TIME

All samples were analyzed within the method recommended holding time.

2.4 LABORATORY BLANK CONTAMINATION

Method and instrument blanks were analyzed for each method to measure laboratory contamination. There was no qualification due to any blank contamination.

2.5 CALIBRATION

Instrument calibration is performed in accordance with the specified EPA methodology. The acceptance of the calibration is determined by the measurement of a method-specific statistical parameter. No results were qualified or rejected due to calibration anomalies.

2.6 PRECISION AND ACCURACY

The precision of the data set was assessed by the relative percent difference (RPD) between duplicate samples (e.g., field duplicate samples or spike duplicate samples). The accuracy of the data set was assessed by the surrogate, MS and LCS percent recoveries.

2.6.1 LCS

LCSs are synthetic samples prepared and analyzed with the same procedure as normal field samples and at the frequency specified in the methods. LCSs are used to further monitor the analytical process and provide a measurement of accuracy. No results were qualified or rejected due to LCS anomalies.

2.6.2 MS/MSD

An MS is a sample spiked with known standards and analyzed in the same procedure as normal field samples and at the frequency of one in 20 normal project samples, as specified in the QAP. This procedure represents a 5 percent frequency. MS/MSD samples are used to monitor the precision and accuracy of the analytical process in the project matrix. There were fifteen MS/MSD pairs analyzed for each method for the set of samples in this report. This represents 7.7 percent of the total project samples analyzed, and therefore, the 5 percent goal was met for this set of samples.

There were 15 results qualified as estimates, "J", due to MS/MSD anomalies. There were no rejected results due to MS/MSD anomalies.

2.6.3 Field Duplicates

Field duplicates were reviewed, and approximately one for every 11 samples or less was collected as a field duplicate and analyzed for the same parameters as the primary sample. This procedure represents 9.2 percent of the total samples collected in the set. The RPDs were calculated for all positive results and are presented in Table 3. All RPDs were within the QAP criteria of less than 20 percent, except for arsenic in samples 10-237-JDSL and 10-251-JDSL. The parent and duplicate of these samples have been flagged "J" for an estimated value. Four of the 36 field duplicate results (11 percent) were qualified due to field precision anomalies associated with this sample set.

2.7 ANALYTE QUANTITATION

Sample results were reviewed and compared against raw instrumental data and preparation logs to check for reporting and quantitation errors. The RLs were reviewed to ensure comparability

to the most recent publications of the review documents referenced. The metals analyzed by EPA Method 6010A met the sensitivity objectives for the QAP. No results were qualified or rejected due to quantitation anomalies.

3.0 DATA QUALITY ISSUES

The most recent versions of the methods and guidance documents referenced in Section 2.0 were used to summarize the quality of the data. The reviewers agreed that the verification process did not identify any rejected analytical results; however, results were qualified due to accuracy anomalies. The anomalies indicated a high bias and the data were flagged as estimated amounts. There were no rejected analytical results identified by the data reviewers.

4.0 CONCLUSIONS AND DATA USABILITY

The overall quality of the data has been summarized and reconciled with the project DQOs to establish and document the usability of the data collected in association with the Resolution Copper Mining LLC human health risk assessment. The general conclusions are discussed in the sections below.

4.1 QA/QC SAMPLES

Field QC samples for this sampling event included field duplicates and MS/MSD samples. Field duplicate samples were collected in the field at a frequency of 9.2 percent and were analyzed for the same analytes as their corresponding original samples. MS/MSD samples also were analyzed at a frequency of 7.8 percent. The field QC results indicate that the field samplers were able to effectively reproduce sample aliquots that were representative of the site.

Laboratory QC included blanks, precision and accuracy analyzed at the frequency outlined in the EPA methods. The laboratory results indicate that the laboratory procedures were in control and that the laboratory was able to produce accurate and precise results. There was no blank contamination and all results were found to be representative of the project site.

4.2 COMPLETENESS AND COMPARIBILITY SUMMARY

Out of 390 primary results, zero results were rejected. Therefore, the completeness of this data set is 100 percent, which meets the project completeness goal of 90 percent. Out of 390 primary sample results, 17 results were qualified as estimates. Estimated results can be used with qualification.

The results reviewed were sampled and analyzed using industry standards. No anomalies were found in the procedures used to produce the final results. The results are comparable with past and current data collected at the site.

4.3 FINAL CONCLUSION

The data review resulted in qualification of 19 out of 426 results as estimates, which represents 4.5 percent of the total data set. There were no rejected results. The qualified data are shown in the attached QRT (Table 2). The completeness for the total data set is 100 percent.

Overall, as shown in the QRT, there were minimal QC deficiencies affecting data quality and usability. The data that were qualified as estimated are of acceptable quality and should be considered usable for their intended purposes. ITSI does not recommend a more rigorous review for this set of data.

5.0 REFERENCES

Brown and Caldwell, 1998, BHP Copper Superior Operation Quality Assurance Project Plan.

Golder Associates, 2006, Quality Assurance Plan, Surface Water Baseline Resource Investigation for Resolution Copper Company, January.

U.S. Environmental Protection Agency (EPA), 1994, Contract Laboratory Program National Functional Guidelines for Evaluating Inorganics Analyses, December.

EPA, 1996, Test Methods for Evaluation Soil Waste, SW-846 Physical/Chemical Methods.

EPA, 2004, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA540-R-04-0400, October.

TABLES

Table 1
Sample Identification Table
Resolution Copper Mining LLC (RCML)
Human Health Risk Assesment

SDG	DMA Laboratory Identification	Sample ID	Collection Date	Matrix	Sample Type	Validtor
HC00130	HC00130	10-233-JDSL	2/21/1998	Soil	Primary	QBD
HC00130	HC00131	10-214-JDSL	2/19/1998	Soil	Primary	QBD
HC00130	HC00132	10-215-JDSL	2/18/1998	Soil	Primary	QBD
HC00130	HC00133	10-188-JDSL	2/17/1998	Soil	Primary	QBD
HC00130	HC00134	10-187-JDSL	2/18/1998	Soil	Primary	QBD
HC00130	HC00135	10-217-JDSL	2/24/1998	Soil	Primary	QBD
HC00130	HC00136	10-192-JDSL	2/24/1998	Soil	Primary	QBD
HC00130	HC00137	10-193-JDSL	2/24/1998	Soil	Primary	QBD
PHD00081	PHD00092	10-108-BDSL	4/1/1998	Soil	Field Duplicate	ITSI
HC00130	HC00138	10-228-JDSL	2/21/1998	Soil	Primary	QBD
HC00130	HC00139	10-248-JDSL	2/21/1998	Soil	Primary	QBD
HC00130	HC00140	10-251-JDSL	2/21/1998	Soil	Primary	QBD
HC00130	HC00141	10-210-JDSL	2/18/1998	Soil	Primary	QBD
HC00130	HC00142	10-207-JDSL	2/19/1998	Soil	Primary	QBD
HC00130	HC00143	10-220-JDSL	2/23/1998	Soil	Primary	QBD
HC00130	HC00144	10-257-JDSL	2/24/1998	Soil	Primary	QBD
HC00130	HC00145	10-222-JDSL	2/23/1998	Soil	Primary	QBD
PHC00017	PHC00058	10-116-BDSL	2/26/1998	Soil	Field Duplicate	QBD
HC00130	HC00146	10-237-JDSL	2/23/1998	Soil	Primary	QBD
HC00130	HC00147	10-174-JDSL	2/17/1998	Soil	Primary	QBD
HC00130	HC00148	10-136-JDSL	2/18/1998	Soil	Primary	QBD
HC00130	HC00149	10-239-JDSL	2/23/1998	Soil	Primary	QBD
HC00130	HC00150	10-264-JDSL	2/24/1998	Soil	Primary	QBD
HC00130	HC00151	10-196-JDSL	2/23/1998	Soil	Primary	QBD
PHC00017	PHC00017	10-122-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00018	10-159-JDSL	2/26/1998	Soil	Primary	QBD
PHC00017	PHC00028	10-124-BDSL	2/25/1998	Soil	Field Duplicate	QBD
PHC00017	PHC00019	10-157-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00020	10-134-JDSL	2/24/1998	Soil	Primary	QBD
PHC00017	PHC00021	10-138-JDSL	2/26/1998	Soil	Primary	QBD
PHC00017	PHC00022	10-149-JDSL	2/26/1998	Soil	Primary	QBD
PHC00017	PHC00023	10-104-JDSL	2/26/1998	Soil	Primary	QBD
PHC00017	PHC00024	10-171-JDSL	2/26/1998	Soil	Primary	QBD
PHC00017	PHC00025	10-102-JDSL	2/26/1998	Soil	Primary	QBD
PHC00017	PHC00026	10-148-JDSL	2/26/1998	Soil	Primary	QBD
PHC00017	PHC00027	10-124-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00029	10-200-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00030	10-198-JDSL	2/25/1998	Soil	Primary	QBD

Table 1
Sample Identification Table
Resolution Copper Mining LLC (RCML)
Human Health Risk Assesment

SDG	DMA Laboratory Identification	Sample ID	Collection Date	Matrix	Sample Type	Validtor
PHC00017	PHC00031	10-201-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00032	10-202-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00033	10-223-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00034	10-166-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00035	10-146-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00036	10-155-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00037	10-135-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00038	10-126-JDSL	2/25/1998	Soil	Primary	QBD
PHC00709	PHC00709	10-143-BDSL	3/7/1998	Soil	Field Duplicate	QBD
PHC00017	PHC00039	10-127-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00049	10-144-BDSL	2/24/1998	Soil	Field Duplicate	QBD
PHC00017	PHC00040	10-203-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00041	10-125-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00042	10-199-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00043	10-204-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00044	10-197-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00045	10-114-JDSL	2/25/1998	Soil	Primary	QBD
PHC00273	PHC00284	10-150-BDSL	3/3/1998	Soil	Field Duplicate	QBD
PHC00017	PHC00046	10-103-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00047	10-156-JDSL	2/25/1998	Soil	Primary	QBD
PHC01970	PHC01972	10-152-BDSL	3/24/1998	Soil	Field Duplicate	ITSI
PHC00017	PHC00048	10-144-JDSL	2/24/1998	Soil	Primary	QBD
PHC00017	PHC00050	10-167-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00051	10-160-JDSL	2/26/1998	Soil	Primary	QBD
PHC00017	PHC00052	10-133-JDSL	2/24/1998	Soil	Primary	QBD
PHC00017	PHC00053	10-145-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00054	10-168-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00056	10-182-JDSL	2/25/1998	Soil	Primary	QBD
PHC00017	PHC00057	10-116-JDSL	2/26/1998	Soil	Primary	QBD
PHC00290	PHC00290	10-137-JDSL	2/26/1998	Soil	Primary	QBD
PHC00290	PHC00291	10-161-JDSL	2/26/1998	Soil	Primary	QBD
PHC00290	PHC00292	10-115-JDSL	2/26/1998	Soil	Primary	QBD
PHC00290	PHC00293	10-105-JDSL	2/26/1998	Soil	Primary	QBD
PHC00290	PHC00294	10-113-JDSL	2/26/1998	Soil	Primary	QBD
PHC00290	PHC00295	10-170-JDSL	2/26/1998	Soil	Primary	QBD
PHC00290	PHC00296	10-154-JDSL	2/271998	Soil	Primary	QBD
PHC00290	PHC00297	10-164-JDSL	2/271998	Soil	Primary	QBD
PHC00017	PHC00055	10-168-BDSL	2/25/1998	Soil	Field Duplicate	QBD

Table 1
Sample Identification Table
Resolution Copper Mining LLC (RCML)
Human Health Risk Assesment

SDG	DMA Laboratory Identification	Sample ID	Collection Date	Matrix	Sample Type	Validtor
PHC00290	PHC00298	10-271-JDSL	2/27/1998	Soil	Primary	QBD
PHC00273	PHC00273	10-106-JDSL	2/271998	Soil	Primary	QBD
PHC00273	PHC00274	10-247-JDSL	2/271998	Soil	Primary	QBD
HC00405	HC00522	10-172-BDSL	2/18/1998	Soil	Field Duplicate	QBD
PHC00273	PHC00275	10-107-JDSL	2/271998	Soil	Primary	QBD
PHC00273	PHC00276	10-286-JDSL	2/271998	Soil	Primary	QBD
PHC00273	PHC00277	10-180-JDSL	2/271998	Soil	Primary	QBD
PHC00273	PHC00278	10-225-JDSL	2/271998	Soil	Primary	QBD
PHC00273	PHC00279	10-259-JDSL	2/271998	Soil	Primary	QBD
PHC00273	PHC00280	10-274-JDSL	2/271998	Soil	Primary	QBD
PHC00273	PHC00281	10-272-JDSL	2/271998	Soil	Primary	QBD
PHC00273	PHC00282	10-139-JDSL	3/3/1998	Soil	Primary	QBD
PHC00273	PHC00283	10-150-JDSL	3/3/1998	Soil	Primary	QBD
PHC00285	PHC00285	10-153-JDSL	3/3/1998	Soil	Primary	QBD
PHC00285	PHC00286	10-128-JDSL	3/3/1998	Soil	Primary	QBD
PHC00285	PHC00287	10-163-JDSL	3/3/1998	Soil	Primary	QBD
PHC00285	PHC00288	10-226-JDSL	3/3/1998	Soil	Primary	QBD
PHC00285	PHC00289	10-162-JDSL	3/3/1998	Soil	Primary	QBD
PHC00498	PHC00498	10-214-AESL	3/6/1998	Soil	Primary	QBD
PHC00498	PHC00499	10-237-AESL	3/6/1998	Soil	Primary	QBD
PHC00498	PHC00500	10-187-AESL	3/6/1998	Soil	Primary	QBD
PHC00498	PHC00501	10-187-AFSL	3/6/1998	Soil	Primary	QBD
PHC00498	PHC00502	10-220-AESL	3/6/1998	Soil	Primary	QBD
PHC00498	PHC00503	10-222-AESL	3/6/1998	Soil	Primary	QBD
PHC00498	PHC00504	10-251-AESL	3/6/1998	Soil	Primary	QBD
PHC00498	PHC00505	10-278-AESL	3/6/1998	Soil	Primary	QBD
PHC00709	PHC00710	10-143-JDSL	3/7/1998	Soil	Primary	QBD
PHC00709	PHC00711	10-165-JDSL	3/7/1998	Soil	Primary	QBD
PHC00709	PHC00712	10-181-JDSL	3/7/1998	Soil	Primary	QBD
PHC00709	PHC00713	10-205-JDSL	3/7/1998	Soil	Primary	QBD
PHC00709	PHC00714	10-110-JDSL	3/9/1998	Soil	Primary	QBD
PHC00709	PHC00715	10-132-JDSL	3/9/1998	Soil	Primary	QBD
PHC00709	PHC00716	10-121-JDSL	3/9/1998	Soil	Primary	QBD
PHC01970	PHC01970	10-141-JDSL	3/24/1998	Soil	Primary	ITSI
PHC01970	PHC01971	10-152-JDSL	3/24/1998	Soil	Primary	ITSI
PHC01970	PHC01973	10-119-JDSL	3/24/1998	Soil	Primary	ITSI
PHC01970	PHC01974	10-130-JDSL	3/24/1998	Soil	Primary	ITSI
PHC01970	PHC01975	10-118-JDSL	3/23/1998	Soil	Primary	ITSI

Table 1
Sample Identification Table
Resolution Copper Mining LLC (RCML)
Human Health Risk Assesment

SDG	DMA Laboratory Identification	Sample ID	Collection Date	Matrix	Sample Type	Validtor
PHC01970	PHC01976	10-117-JDSL	3/23/1998	Soil	Primary	ITSI
PHC01970	PHC01977	10-151-JDSL	3/23/1998	Soil	Primary	ITSI
PHC01970	PHC01978	10-179-JDSL	3/23/1998	Soil	Primary	ITSI
PHD00081	PHD00081	10-131-JDSL	4/1/1998	Soil	Primary	ITSI
PHD00081	PHD00082	10-108-JDSL	4/1/1998	Soil	Primary	ITSI
PHD00081	PHD00083	10-120-JDSL	4/1/1998	Soil	Primary	ITSI
PHD00081	PHD00084	10-142-JDSL	4/1/1998	Soil	Primary	ITSI
PHD00081	PHD00085	10-109-JDSL	4/1/1998	Soil	Primary	ITSI
PHD00081	PHD00086	10-129-JDSL	3/31/1998	Soil	Primary	ITSI
PHD00081	PHD00087	10-140-JDSL	3/31/1998	Soil	Primary	ITSI
HC00405	HC00405	10-283-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00406	10-218-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00407	10-219-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00465	10-215-BDSL	2/21/1998	Soil	Field Duplicate	QBD
HC00405	HC00408	10-278-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00409	10-276-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00411	10-195-JDSL	2/23/1998	Soil	Primary	QBD
HC00405	HC00412	10-224-JDSL	2/23/1998	Soil	Primary	QBD
HC00405	HC00414	10-245-JDSL	2/23/1998	Soil	Primary	QBD
HC00405	HC00415	10-244-JDSL	2/23/1998	Soil	Primary	QBD
HC00405	HC00416	10-262-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00417	10-258-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00418	10-246-JDSL	2/23/1998	Soil	Primary	QBD
HC00405	HC00420	10-241-JDSL	2/23/1998	Soil	Primary	QBD
HC00405	HC00421	10-242-JDSL	2/23/1998	Soil	Primary	QBD
HC00405	HC00422	10-240-JDSL	2/23/1998	Soil	Primary	QBD
HC00405	HC00423	10-221-JDSL	2/23/1998	Soil	Primary	QBD
HC00405	HC00424	10-238-JDSL	2/23/1998	Soil	Primary	QBD
HC00405	HC00425	10-243-JDSL	2/23/1998	Soil	Primary	QBD
HC00405	HC00426	10-261-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00427	10-265-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00462	10-230-BDSL	2/21/1998	Soil	Field Duplicate	QBD
HC00405	HC00428	10-260-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00430	10-263-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00432	10-279-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00433	10-282-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00434	10-280-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00435	10-194-JDSL	2/24/1998	Soil	Primary	QBD

Table 1
Sample Identification Table
Resolution Copper Mining LLC (RCML)
Human Health Risk Assesment

SDG	DMA Laboratory Identification	Sample ID	Collection Date	Matrix	Sample Type	Validtor
HC00405	HC00436	10-281-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00437	10-277-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00413	10-237-BDSL	2/23/1998	Soil	Field Duplicate	QBD
HC00405	HC00438	10-285-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00439	10-284-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00440	10-273-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00442	10-270-JDSL	2/24/1998	Soil	Primary	QBD
HC00405	HC00443	10-189-JDSL	2/18/1998	Soil	Primary	QBD
HC00405	HC00444	10-178-JDSL	2/17/1998	Soil	Primary	QBD
HC00405	HC00445	10-207-JDSL	2/19/1998	Soil	Primary	QBD
HC00405	HC00446	10-209-JDSL	2/19/1998	Soil	Primary	QBD
HC00405	HC00447	10-212-JDSL	2/19/1998	Soil	Primary	QBD
HC00405	HC00419	10-246-BDSL	2/23/1998	Soil	Field Duplicate	QBD
HC00405	HC00448	10-216-JDSL	2/19/1998	Soil	Primary	QBD
HC00405	HC00449	10-227-JDSL	2/19/1998	Soil	Primary	QBD
HC00405	HC00450	10-232-JDSL	2/19/1998	Soil	Primary	QBD
HC00405	HC00451	10-234-JDSL	2/19/1998	Soil	Primary	QBD
HC00405	HC00452	10-236-JDSL	2/19/1998	Soil	Primary	QBD
HC00405	HC00454	10-231-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00453	10-251-BDSL	2/21/1998	Soil	Field Duplicate	QBD
HC00405	HC00455	10-250-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00456	10-268-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00457	10-252-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00458	10-249-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00459	10-229-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00460	10-269-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00461	10-256-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00463	10-230-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00464	10-267-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00466	10-147-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00468	10-206-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00469	10-213-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00431	10-263-BDSL	2/24/1998	Soil	Field Duplicate	QBD
HC00405	HC00470	10-208-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00471	10-211-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00472	10-254-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00473	10-253-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00474	10-266-JDSL	2/21/1998	Soil	Primary	QBD

Table 1
Sample Identification Table
Resolution Copper Mining LLC (RCML)
Human Health Risk Assesment

SDG	DMA Laboratory Identification	Sample ID	Collection Date	Matrix	Sample Type	Validtor
HC00405	HC00475	10-255-JDSL	2/21/1998	Soil	Primary	QBD
HC00405	HC00476	10-191-JDSL	2/21/198	Soil	Primary	QBD
HC00405	HC00512	10-100-JDSL	2/13/1998	Soil	Primary	QBD
PHC00290	PHC00299	10-271-BDSL	2/27/1998	Soil	Field Duplicate	QBD
HC00405	HC00513	10-101-JDSL	2/17/1998	Soil	Primary	QBD
HC00405	HC00514	10-111-JDSL	2/17/1998	Soil	Primary	QBD
HC00405	HC00441	10-273-BDSL	2/24/1998	Soil	Field Duplicate	QBD
HC00405	HC00515	10-112-JDSL	2/17/1998	Soil	Primary	QBD
HC00405	HC00516	10-123-JDSL	2/17/1998	Soil	Primary	QBD
HC00405	HC00517	10-183-JDSL	2/17/1998	Soil	Primary	QBD
HC00405	HC00410	10-276-BDSL	2/24/1998	Soil	Field Duplicate	QBD
HC00405	HC00518	10-184-JDSL	2/17/1998	Soil	Primary	QBD
HC00405	HC00519	10-185-JDSL	2/17/1998	Soil	Primary	QBD
HC00405	HC00520	10-186-JDSL	2/17/1998	Soil	Primary	QBD
HC00405	HC00521	10-172-JDSL	2/18/1998	Soil	Primary	QBD
HC00405	HC00523	10-175-JDSL	2/18/1998	Soil	Primary	QBD
HC00405	HC00524	10-177-JDSL	2/18/1998	Soil	Primary	QBD
HC00405	HC00525	10-190-JDSL	2/18/1998	Soil	Primary	QBD
HC00405	HC00526	10-173-JDSL	2/18/1998	Soil	Primary	QBD
HC00405	HC00527	10-176-JDSL	2/18/1998	Soil	Primary	QBD
HC00405	HC00531	10-158-JDSL	2/18/1998	Soil	Primary	QBD
HC00405	HC00532	10-235-JDSL	2/19/1998	Soil	Primary	QBD
HC00405	HC00533	10-275-JDSL	2/24/1998	Soil	Primary	QBD

Notes:

DMA = Del Mar Analytical
ITSI = Innovative Technical Solutions, Inc.
QBD = Quality by Design
SDG = Sample Delivery Group

Table 2
Qualified Results Table for
Resolution Copper Mining LLC (RCML)
Human Health Risk Assessment

Sample ID	DMA Laboroatry ID	Matrix	Parameter	Original Value	Original Qualifier	Added Qualifier	New Value	Units	Reason	Method
10-159-JDSL	PHC00018	Soil	Arsenic	9.5		J	9.5 J	mg/Kg	MS/MSD %R	EPA 6010A
10-116-JDSL	PHC00057	Soil	Arsenic	160		J	160 J	mg/Kg	MS/MSD %R	EPA 6010A
10-134-JDSL	PHC00020	Soil	Arsenic	190		J	190 J	mg/Kg	MS/MSD %R	EPA 6010A
10-133-JDSL	PHC00052	Soil	Arsenic	82		J	82 J	mg/Kg	MS/MSD %R	EPA 6010A
10-122-JDSL	PHC00017	Soil	Arsenic	39		J	39 J	mg/Kg	MS/MSD %R	EPA 6010A
10-157-JDSL	PHC00019	Soil	Arsenic	380		J	380 J	mg/Kg	MS/MSD %R	EPA 6010A
10-124-JDSL	PHC00027	Soil	Arsenic	91		J	91 J	mg/Kg	MS/MSD %R	EPA 6010A
10-200-JDSL	PHC00029	Soil	Arsenic	46		J	46 J	mg/Kg	MS/MSD %R	EPA 6010A
10-198-JDSL	PHC00030	Soil	Arsenic	51		J	51 J	mg/Kg	MS/MSD %R	EPA 6010A
10-223-JDSL	PHC00033	Soil	Arsenic	67		J	67 J	mg/Kg	MS/MSD %R	EPA 6010A
10-135-JDSL	PHC00037	Soil	Arsenic	9.5		J	9.5 J	mg/Kg	MS/MSD %R	EPA 6010A
10-199-JDSL	PHC00042	Soil	Arsenic	49		J	49 J	mg/Kg	MS/MSD %R	EPA 6010A
10-197-JDSL	PHC00044	Soil	Arsenic	31		J	31 J	mg/Kg	MS/MSD %R	EPA 6010A
10-156-JDSL	PHC00047	Soil	Arsenic	81		J	81 J	mg/Kg	MS/MSD %R	EPA 6010A
10-145-JDSL	PHC00053	Soil	Arsenic	200		J	200 J	mg/Kg	MS/MSD %R	EPA 6010A
10-237-JDSL	HC00146	Soil	Arsenic	5,100		J	5100 J	mg/Kg	Field Duplicate RPD	EPA 6010A
10-237-BDSL	HC00413	Soil	Arsenic	6,800		J	6800 J	mg/Kg	Field Duplicate RPD	EPA 6010A
10-251-JDSL	HC00140	Soil	Arsenic	470		J	470 J	mg/Kg	Field Duplicate RPD	EPA 6010A
10-251-BDSL	HC00453	Soil	Arsenic	350		J	350 J	mg/Kg	Field Duplicate RPD	EPA 6010A

Notes:

mg/Kg = milligrams per kilogram

J = Estimated value

DMA = Del Mar Analytical

ITSI = Innovative Technical Solutions, Inc.

MS/MSD = matrix spike/matrix spike duplicate

QBD = Quality by Design

RPD = relative percent difference

Table 3
Field Duplicate Results and Evaluation Table
Resolution Copper Mining LLC (RCML)
Human Health Assessment Risk

Location	DMA Laboratory Primary Sample ID	DMA Laboratory Duplicate ID	Sampling Date	Analyte	Primary Sample Result mg/Kg	Field Duplicate Result mg/Kg	RPD (%)	RPD < QAPP Criteria?
10-124-JDSL	PHC00027	PHC00028	2/25/1998	Arsenic	88	91	3.4	Yes
				Copper	920	970	5.3	Yes
10-144-JDSL	PHC00048	PHC00049	2/24/1998	Arsenic	88	89	1.1	Yes
				Copper	1,100	1,200	8.7	Yes
10-168-JDSL	PHC00054	PHC00055	2/25/1998	Arsenic	20	23	14.0	Yes
				Copper	1,900	2,000	5.1	Yes
10-116-JDSL	PHC00057	PHC00058	2/26/1998	Arsenic	160	150	6.5	Yes
				Copper	650	550	16.7	Yes
10-150-JDSL	PHC00283	PHC00284	3/3/1998	Arsenic	6.2	5.9	5.0	Yes
				Copper	540	570	5.4	Yes
10-271-JDSL	PHC00298	PHC00299	2/27/1998	Arsenic	720	800	10.5	Yes
				Copper	25,000	29,000	14.8	Yes
10-143-JDSL	PHC00710	PHC00709	3/7/1998	Arsenic	95	100	5.1	Yes
				Copper	1,100	1,100	0.0	Yes
10-152-JDSL	PHC01971	PHC01972	3/24/1998	Arsenic	150	150	0.0	Yes
				Copper	2,900	3,000	3.4	Yes
10-108-JDSL	PHD00082	PHC00092	4/1/1998	Arsenic	65	66	1.5	Yes
				Copper	700	720	2.8	Yes
10-276-JDSL	HC00409	HC00410	2/24/1998	Arsenic	95	89	6.5	Yes
				Copper	7,300	7,400	1.4	Yes
10-237-JDSL	HC00146	HC00413	2/23/1998	Arsenic	5,100	6,800	28.6	No
				Copper	220,000	190,000	14.6	Yes
10-246-JDSL	HC00418	HC00419	2/23/1998	Arsenic	31	30	3.3	Yes
				Copper	290	300	3.4	Yes
10-263-JDSL	HC00430	HC00431	2/24/1998	Arsenic	49	43	13.0	Yes
				Copper	5,100	5,100	0.0	Yes
10-273-JDSL	HC00440	HC00441	2/24/1998	Arsenic	60	56	6.9	Yes
				Copper	1,300	1,400	7.4	Yes
10-251-JDSL	HC00140	HC00453	2/21/1998	Arsenic	470	350	29.3	No
				Copper	16,000	16,000	0.0	Yes
10-230-JDSL	HC00463	HC00462	2/21/1998	Arsenic	1,500	1,500	0.0	Yes
				Copper	18,000	19,000	5.4	Yes

Table 3
Field Duplicate Results and Evaluation Table
Resolution Copper Mining LLC (RCML)
Human Health Assessment Risk

Location	DMA Laboratory Primary Sample ID	DMA Laboratory Duplicate ID	Sampling Date	Analyte	Primary Sample Result mg/Kg	Field Duplicate Result mg/Kg	RPD (%)	RPD < QAPP Criteria?
10-215-JDSL	HC00132	HC00465	2/18/1998 2/21/1998	Arsenic	2,300	2,200	4.4	Yes
				Copper	35,000	38,000	8.2	Yes
10-172-JDSL	HC00521	HC00522	2/18/1998	Arsenic	86	94	8.9	Yes
				Copper	68,000	68,000	0.0	Yes

Notes:

mg/Kg = milligrams per kilogram
DMA = Del Mar Analytical
QAPP = Quality Assurance Plan
RPD = Relative percent difference

APPENDIX A

LABORATORY REPORTS

APPENDIX B

QBD DATA VALIDATION REPORTS

Quality By Design

Laboratory Quality Assurance Consulting

97 Puhili Street
Hilo, Hawaii 96720

Phone: (808) 969-9424
Fax: (808) 969-9094

DATA VALIDATION REPORT

BHP Copper Superior Operations

Type of Samples: Soil
Dates of Sampling: February 17 - March 10, 1998

Prepared for:

Brown and Caldwell
3636 North Central Avenue, Suite 200
Phoenix, Arizona 85012

Contract No. 15-4089/50
QBD Job No. 104

Reviewed and Approved:

Thomas Davis

April 19, 1998
Date

Prepared by:

Lorraine Herzig

April 15, 1998
Date

Table of Contents

This data validation report consists of the following stand alone sections, each of which is formatted to follow Functional Guidelines but which also include subsections discussing QBD contacts with the laboratory, other comments, and a summary table of data qualifiers.

A. Introduction

Laboratory Sciences, Inc., dba Quality by Design, has completed an EPA Level III Data Validation, plus a cursory review of the raw data, on the submitted data packages in accordance with Task No. 15-6376/01.

The reporting format and criteria for recommending data qualifying flags for this data set are described in USEPA *"Functional Guidelines for Evaluating Inorganics Analyses"*, as revised, December, 1994, using criteria listed in the method referenced, and criteria listed in the Brown and Caldwell BHP Copper Superior Operations QAPP. Data may be qualified for any of several reasons:

1. By the laboratory prior to receipt by the reviewer;
2. Because of laboratory deviation from the designated method;
3. Because the data may not meet the criteria listed in the reference above; or
4. By the professional judgment of the reviewer.

The data set consists of twelve data packages from Del Mar Analytical Laboratory in Phoenix, Arizona and contains data for the samples listed in Table 1.

The data packages consists of an EPA Level III laboratory deliverable report, which includes analytical results for each sample, blank sample results, both laboratory and client sample identifications, appropriate dates but not times, reporting limits, method references, surrogate recoveries as appropriate, and the laboratory's name, license number, and address, plus copies of the completed chain-of-custody forms and a Quality Control (QC) data package. This Level III Quality Control package includes a tabular listing of the laboratory's sample identification, spiking concentrations, recoveries, percentage calculations, and acceptance windows. In addition, there were laboratory defined Level IV data packages, consisting of raw data and instrument printouts. The custody forms include the receipt of the sample but not the laboratory's internal tracking.

Table 1. Sample Data Received

Client Sample Identification	Laboratory Identification	Copper by EPA 6010A	Arsenic by EPA 6010A or7060A
10 -264-AESL	PHC00634	X	X
10 -564-AFSL	PHC00635	X	X
10 -248-AESL	PHC00789	X	X
10 -172-AESL	PHC00790	X	X
10 -228-AESL	PHC00705	X	X
10 -228 -AFSL	PHC00706	X	X
10 -233-AESL	PHC00707	X	X
10 -233-AFSL	PHC00708	X	X
10 -143-BDSL	PHC00709	X	X
10 -143-JDSL	PHC00710	X	X
10 -165-JDSL	PHC00711	X	X
10 -181-JDSL	PHC00712	X	X
10 -205-JDSL	PHC00713	X	X
10 -110-JDSL	PHC00714	X	X
10 -132-JDSL	PHC00715	X	X
10 -121-JDSL	PHC00716	X	X
10 -153-JDSL	PHC00285	X	X
10 -128-JDSL	PHC00286	X	X
10 -163-JDSL	PHC00287	X	X
10 -226-JDSL	PHC00288	X	X
10 -162-JDSL	PHC00289	X	X
10 -283-JDSL	HC00405	X	X
10 -218-JDSL	HC00406	X	X
10 -219-JDSL	HC00407	X	X
10 -278-JDSL	HC00408	X	X
10 -276-JDSL	HC00409	X	X
10 -276-BDSL	HC00410	X	X
10 -195-JDSL	HC00411	X	X
10 -224-JDSL	HC00412	X	X
10 -237-BDSL	HC00413	X	X
10 -245-JDSL	HC00414	X	X
10 -244-JDSL	HC00415	X	X

Client Sample Identification	Laboratory Identification	Copper by EPA 6010A	Arsenic by EPA 6010A or7060A
10 -262-JDSL	HC00416	X	X
10 -258-JDSL	HC00417	X	X
10 -246-JDSL	HC00418	X	X
10 -246-BDSL	HC00419	X	X
10 241 -JDSL	HC00420	X	X
10 -242-JDSL	HC00421	X	X
10 -240-JDSL	HC00422	X	X
10 221 -JDSL	HC00423	X	X
10 -238-JDSL	HC00424	X	X
10 -243-JDSL	HC00425	X	X
10 -261-JDSL	HC00426	X	X
10 -265-JDSL	HC00427	X	X
10 -260-JDSL	HC00428	X	X
10 -263-JDSL	HC00430	X	X
10 -263-BDSL	HC00431	X	X
10 -279-JDSL	HC00432	X	X
10 -282-JDSL	HC00433	X	X
10 -280-JDSL	HC00434	X	X
10 -194-JDSL	HC00435	X	X
10 -281-JDSL	HC00436	X	X
10 -277-JDSL	HC00437	X	X
10 -285-JDSL	HC00438	X	X
10 -284-JDSL	HC00439	X	X
10 -273-JDSL	HC00440	X	X
10 -273-BDSL	HC00441	X	X
10 -270-JDSL	HC00442	X	X
10 -189-JDSL	HC00443	X	X
10 -178-JDSL	HC00444	X	X
10 -207-JDSL	HC00445	X	X
10 -209-JDSL	HC00446	X	X
10 -212-JDSL	HC00447	X	X
10 -216-JDSL	HC00448	X	X
10 -227-JDSL	HC00449	X	X
10 -232-JDSL	HC00450	X	X

Client Sample Identification	Laboratory Identification	Copper by EPA 6010A	Arsenic by EPA 6010A or7060A
10 -234-JDSL	HC00451	X	X
10 -236-JDSL	HC00452	X	X
10 -251-BDSL	HC00453	X	X
10 -231-JDSL	HC00454	X	X
10 -250-JDSL	HC00455	X	X
10 -268-JDSL	HC00456	X	X
10 -252-JDSL	HC00457	X	X
10 -249-JDSL	HC00458	X	X
10 -229-JDSL	HC00459	X	X
10 -269-JDSL	HC00460	X	X
10 -256-JDSL	HC00461	X	X
10 -230-BDSL	HC00462	X	X
10 -230-JDSL	HC00463	X	X
10 -267-JDSL	HC00464	X	X
10 -215-BDSL	HC00465	X	X
10 -147-JDSL	HC00466	X	X
10 -206-JDSL	HC00468	X	X
10 -213-JDSL	HC00469	X	X
10 -208-JDSL	HC00470	X	X
10 -211-JDSL	HC00471	X	X
10 -254-JDSL	HC00472	X	X
10 -253-JDSL	HC00473	X	X
10 -266-JDSL	HC00474	X	X
10 -255-JDSL	HC00475	X	X
10 -191-JDSL	HC00476	X	X
10 -100-JDSL	HC00512	X	X
10 -101-JDSL	HC00513	X	X
10 -111-JDSL	HC00514	X	X
10 -112-JDSL	HC00515	X	X
10 -123-JDSL	HC00516	X	X
10 -183-JDSL	HC00517	X	X
10 -184-JDSL	HC00518	X	X
10 -185-JDSL	HC00519	X	X
10 -186-JDSL	HC00520	X	X

Client Sample Identification	Laboratory Identification	Copper by EPA 6010A	Arsenic by EPA 6010A or7060A
10 -172-JDSL	HC00521	X	X
10 -172-BDSL	HC00522	X	X
10 -175-JDSL	HC00523	X	X
10 -177-JDSL	HC00524	X	X
10 -190-JDSL	HC00525	X	X
10 -173-JDSL	HC00526	X	X
10 -176-JDSL	HC00527	X	X
10 -158-JDSL	HC00531	X	X
10 -235-JDSL	HC00532	X	X
10 -275-JDSL	HC00533	X	X
10 -233-JDSL	HC00130	X	X
10 -214-JDSL	HC00131	X	X
10 -215-JDSL	HC00132	X	X
10 -188-JDSL	HC00133	X	X
10 -187-JDSL	HC00134	X	X
10 -217-JDSL	HC00135	X	X
10 -192-JDSL	HC00136	X	X
10 -193-JDSL	HC00137	X	X
10 -228-JDSL	HC00138	X	X
10 -248-JDSL	HC00139	X	X
10 -251-JDSL	HC00140	X	X
10 -210-JDSL	HC00141	X	X
10 -207-JDSL	HC00142	X	X
10 -220-JDSL	HC00143	X	X
10 -257-JDSL	HC00144	X	X
10 -222-JDSL	HC00145	X	X
10 -237-JDSL	HC00146	X	X
10 -174-JDSL	HC00147	X	X
10 -136-JDSL	HC00148	X	X
10 -239-JDSL	HC00149	X	X
10 -264-JDSL	HC00150	X	X
10 -196-JDSL	HC00151	X	X
10 -137-JDSL	PHC00290	X	X
10 -161-JDSL	PHC00291	X	X

Client Sample Identification	Laboratory Identification	Copper by EPA 6010A	Arsenic by EPA 6010A or7060A
10 -115-JDSL	PHC00292	X	X
10 -105-JDSL	PHC00293	X	X
10 -113-JDSL	PHC00294	X	X
10 -170-JDSL	PHC00295	X	X
10 -154-JDSL	PHC00296	X	X
10 -164-JDSL	PHC00297	X	X
10 -271-JDSL	PHC00298	X	X
10 -271-BDSL	PHC00299	X	X
10 -106-JDSL	PHC00273	X	X
10 -247-JDSL	PHC00274	X	X
10 -107-JDSL	PHC00275	X	X
10 -286-JDSL	PHC00276	X	X
10 -180-JDSL	PHC00277	X	X
10 -225-JDSL	PHC00278	X	X
10 -259-JDSL	PHC00279	X	X
10 -274-JDSL	PHC00280	X	X
10 -272-JDSL	PHC00281	X	X
10 -139-JDSL	PHC00282	X	X
10 -150-JDSL	PHC00283	X	X
10 -150-BDSL	PHC00284	X	X
10 -136-JDSL	PHC00434	X	X
10 -228-JDSL	PHC00435	X	X
10 -233-JDSL	PHC00436	X	X
10 -237-JDSL	PHC00437	X	X
10 -239-JDSL	PHC00438	X	X
10 -214-AESL	PHC00498	X	X
10 -237-AESL	PHC00499	X	X
10 -187-AESL	PHC00500	X	X
10 -187-AFSL	PHC00501	X	X
10 -220-AESL	PHC00502	X	X
10 -222-AESL	PHC00503	X	X
10 -251-AESL	PHC00504	X	X
10 -278-AESL	PHC00505	X	X
10 -122-JDSL	PCH00017	X	X

Client Sample Identification	Laboratory Identification	Copper by EPA 6010A	Arsenic by EPA 6010A or7060A
10 -159-JDSL	PCH00018	X	X
10 -157-JDSL	PCH00019	X	X
10 -134-JDSL	PCH00020	X	X
10 -138-JDSL	PCH00021	X	X
10 -149-JDSL	PCH00022	X	X
10 -104-JDSL	PCH00023	X	X
10 -171-JDSL	PCH00024	X	X
10 -102-JDSL	PCH00025	X	X
10 -148-JDSL	PCH00026	X	X
10 -124-JDSL	PCH00027	X	X
10 -124-BDSL	PCH00028	X	X
10 -200-JDSL	PCH00029	X	X
10 -198-JDSL	PCH00030	X	X
10 -201-JDSL	PCH00031	X	X
10 -202-JDSL	PCH00032	X	X
10 -223-JDSL	PCH00033	X	X
10 -166-JDSL	PCH00034	X	X
10 -146-JDSL	PCH00035	X	X
10 -155-JDSL	PCH00036	X	X
10 -135-JDSL	PCH00037	X	X
10 -126-JDSL	PCH00038	X	X
10 -127-JDSL	PCH00039	X	X
10 -203-JDSL	PCH00040	X	X
10 -125-JDSL	PCH00041	X	X
10 -199-JDSL	PCH00042	X	X
10 -204-JDSL	PCH00043	X	X
10 -197-JDSL	PCH00044	X	X
10 -114-JDSL	PCH00045	X	X
10 -103-JDSL	PCH00046	X	X
10 -156-JDSL	PCH00047	X	X
10 -144-JDSL	PCH00048	X	X
10 -144-BDSL	PCH00049	X	X
10 -167-JDSL	PCH00050	X	X
10 -160-JDSL	PCH00051	X	X

Client Sample Identification	Laboratory Identification	Copper by EPA 6010A	Arsenic by EPA 6010A or7060A
10 -133-JDSL	PCH00052	X	X
10 -145-JDSL	PCH00053	X	X
10 -168-JDSL	PCH00054	X	X
10 -168-BDSL	PCH00055	X	X
10 -182-JDSL	PCH00056	X	X
10 -116-JDSL	PCH00057	X	X
10 -116-BDSL	PCH00058	X	X

B. Review of Metals Analyses

1. Timeliness and a Check for Errors.

The data packages were reviewed and compared against the chain-of-custody and other data. Except as noted below, no data are missing from the package and no errors in accuracy were found. All tests requested on the chain-of-custody were performed. There are no contractual holding time criteria that have been brought to the attention of the reviewer.

Discussion: There is no place on the Chain-of-Custody that gives reference to the laboratory identification or laboratory job identification. The laboratory did provide a separate cross reference showing client identification and correlating laboratory identification.

The laboratory is not utilizing adequate significant figures when reporting percent recovery values. It appears the data reduction software is rounding the final result and then the result is rounded again on the summary forms.

The analysis of all samples for inorganic parameters did not show an exact date of analysis. Since the range of dates given for the analysis meets the holding times of all parameters, no data qualifier flags are recommended. Quality By Design recommends that the laboratory list out the dates of analysis for each analyte rather than a range of time for future work.

The laboratory signature for data package HC00443 shows a break in custody between the date and time relinquished to the date and time received. There is no indication in the package that a courier or express service was used.

There is a sample identification error on Page 39 of data package HC00443. Sample HC00445 should be labeled as 10-207-JDSL. The laboratory has been contacted to correct and reissue the page directly to Brown and Caldwell.

There is a possible error with the laboratory identification for Sample No. 10-158-JDSL on Pages 26 and 309 of data package HC00443. The lab has given this sample name the identification name of HC00453 and HC00532. Since there is no cross reference to the chain-of-custody, the reviewer cannot determine which laboratory identification number is correct. The laboratory has

been contacted to review the identification numbers and reissue revised pages directly to Brown and Caldwell.

There is no laboratory receiving signature on the chain-of-custody form for data package HC00130.

For data packages PHC00789, PHC00705, PHC00709, PHC00285, HC00130, PHC00434, PHC00498 and HC00443, the chain-of-custody requested that Arsenic be analyzed by EPA Method 7060A, an analysis by graphite furnace with typically lower detection limits. The laboratory ran the samples by EPA Method 6010A, which is by inductively coupled argon plasma analysis with typically higher detection limits. The concentration of the samples were above the Method 6010A detection limits and no data qualifier flags are recommended.

For data packages PHC00290, PHC00273 and PHC00017, the chain-of-custody requested that Arsenic be analyzed by EPA Method 7060A, an analysis by graphite furnace with typically lower detection limits. With exception of Samples No. 10-170-JDSL, 10-225-JDSL, 10-201-JDSL and 10-126-JDSL, the laboratory ran the samples by EPA Method 6010A, which is by inductively coupled argon plasma analysis with typically higher detection limits. The concentration of the samples were above the Method 6010A detection limits and no data qualifier flags are recommended.

2. Initial and Continuing Calibration

Except as noted below, all initial calibration QC criteria for the referenced method were met, including the number of standards used and correlation coefficients. All continuing calibration criteria, including frequency of analysis and percent recovery (%R) were met.

Discussion: The Initial and Continuing Calibration Report for data package PHC00434, on analysis date March 10, 1998, was not provided. The reviewer checked the raw data and the initial and continuing calibration checks were in criteria. The laboratory has been contacted to provide this report directly to Brown and Caldwell.

3. Blanks and Checks for Contamination

Instrument and method blank analyses were performed at the frequencies required in the referenced method and either no target analytes were detected or levels were below the reporting levels.

4. Laboratory Control Sample (LCS) Analysis

Except as noted below, an LCS was analyzed at the frequency required by the referenced method and all percent recoveries were within method and QAPP criteria.

Discussion: The Corrective Action Form for data package PHC00017 states that analysis run on March 5, 1998 had an Laboratory Control Sample result of 168% recovery for Copper. The Laboratory Control Standard report sheet and the raw data show the analysis date of March 6, 1998. The laboratory has been contacted to correct the date and reissue a revised page directly to Brown and Caldwell.

5. Matrix Spike Analysis

Except as noted below, matrix spikes (MS) and matrix spike duplicates (MSD) were analyzed as required by the referenced method and all percent recoveries were method and QAPP criteria.

Associated Samples	TCL Compound Affected	Type of Deviation	Flag
10-159-JDSL	Arsenic	Matrix Spike	9.5 J
10-116-JDSL			160 J
10-134-JDSL			190 J
10-133-JDSL			82 J
10-122-JDSL			39 J
10-157-JDSL			380 J
10-124-JDSL			91 J
10-200-JDSL			46 J
10-198-JDSL			51 J
10-223-JDSL			67 J
10-135-JDSL			9.5 J

Associated Samples	TCL Compound Affected	Type of Deviation	Flag
10-199-JDSL	Arsenic	Matrix Spike	49 J
10-197-JDSL			31 J
10-156-JDSL			81 J
10-145-JDSL			200 J

Discussion: The MS/MSD percent recoveries for Arsenic by EPA Method 6010A were out of criteria for accuracy at 203% and 177%. Per EPA's Functional Guidelines, Section VII.D.1, all Arsenic results associated with digestion batch represented by this MS/MSD pair, even if the post-digestion spike is acceptable, should be flagged "J" for estimated.

For data package HC00130, Page 28, there was a transcription error for the Copper MS result. The value should read 34,000, not 3400. The correction results in acceptable relative percent difference (RPD) for the spike and spike duplicate. The laboratory has been contacted to revise the page and reissue the page directly to Brown and Caldwell.

Spike recoveries for both Arsenic and Copper were out of method and QAPP criteria for data associated with data packages PHC00634, PHC00285, HC00130, PHC00290, PHC00273, PHC00434, PHC00498, PHC000017, and HC00443. According to Functional Guidelines, the criteria should not apply when the concentration of the sample is at least four times (4x) greater than the concentration of the spike. In all cases, the concentration of the sample was 4x greater than the concentration of the spike. Since all other quality control checks were in criteria, no data qualifier flags are recommended.

The laboratory attributed the MS/MSD results that were out of criteria due to matrix interference. While this may be the cause for the results to be out of criteria, it is more likely due to the high analyte concentrations in the samples.

6. Sample Result Verification

The final reports were reviewed and compared against raw instrumental data and logs to check anomalies, data reduction/calculations, transcription and dilutions. No errors in accuracy were found.

7. Field Duplicates

The following samples were identified as field duplicates. All relative percent differences (RPD) were within the guidelines of the QAPP.

Arsenic	Original Sample	Duplicate Sample	RPD
10-143-JDSL	95	100	5.1
10-276-JDSL	95	89	6.5
10-215-JDSL	2,300	2,200	4.4
10-251-JDSL	470	350	29.3
10-230-JDSL	1,500	1,500	0
10-263-JDSL	49	43	13.0
10-273-JDSL	60	56	6.9
10-246-JDSL	31	30	3.3
10-172-JDSL	86	94	8.9
10-237-JDSL	5,100	6,800	28.6
10-271-JDSL	720	800	10.5
10-150-JDSL	6.2	5.9	5.0
10-144-JDSL	88	89	1.1
10-168-JDSL	20	23	14.0
10-124-JDSL	88	91	3.4
10-116-JDSL	160	150	6.5

Copper	Original Sample	Duplicate Sample	RPD
10-143-JDSL	1,100	1,100	0
10-276-JDSL	7,300	7,400	1.4
10-215-JDSL	35,000	38,000	8.2
10-251-JDSL	16,000	16,000	0
10-230-JDSL	18,000	19,000	5.4
10-263-JDSL	5,100	5,100	0
10-273-JDSL	1,300	1,400	7.4
10-246-JDSL	290	300	3.4
10-172-JDSL	68,000	68,000	0
10-237-JDSL	220,000	190,000	14.6
10-271-JDSL	25,000	29,000	14.8
10-150-JDSL	540	570	5.4

Copper	Original Sample	Duplicate Sample	RPD
10-144-JDSL	1,100	1,200	8.7
10-168-JDSL	1,900	2,000	5.1
10-124-JDSL	920	970	5.3
10-116-JDSL	650	550	16.7

8. Laboratory Contact

On April 11, 1998 the QBD project manager faxed June Baker and Beth Price at Del Mar Analytical Laboratory regarding possible transcription errors, missing reports, and revising data pages. The revised pages were requested to be sent directly to Brown and Caldwell. A copy of the fax is attached to this report.

On April 13, 1998 QBD faxed Beth Price a request for the Graphite Furnace (EPA Method 7060A) results for Samples No. 10-201-JDSL and 10-126-JDSL, which were not found in the data packages.

9. Other Comments

The laboratory is providing Quality Control information in different formats. For example, data package PHC00290 has the LCS report in two different formats. The laboratory should decide on which format to use and be consistent throughout the data packages.

The laboratory is also providing additional Quality Control Reports not associated with the requested analysis. For example, with data package PHC00017, there is an LCS report for Silver, which was not requested.

13. Data Use and Overall Assessment

The data, as qualified, are acceptable for use. The analyses were generally within the requirements of the referenced method and no discrepancies were observed between raw data and reported data results.

Inorganics

Inorganics

U = The analyte was analyzed for but not detected above the numerical quantitation limit. the numerical value may be either a detection limit or a quantitation limit.

J = The analyte was analyzed for and was positively identified. but the associated numerical value is an estimated quantity. EPA Region X describes the data as able to be seriously considered for decision making and useable for many purposes.

In EPA Region X, a subscript may be appended to the "J" that indicates which of the following control criteria were not met:

1 Blank contamination
2 Calibration range exceeded
3 Holding times not met
4 Other QC outside of criteria

UJ = The analyte was analyzed for but was not detected above the reporting level, but the reporting level is an estimated level.

R = The data are unusable for all purposes. The analyte was analyzed for, but may or may not be present.

G. Summary Table of Data Qualifier Flags

Project Name: BHP Copper Superior Operations
Types of Samples: Soils

Associated Samples	TCL Compound Affected	Type of Deviation	Flag
10-159-JDSL	Arsenic	Matrix Spike	9.5 J
10-116-JDSL			160 J
10-134-JDSL			190 J
10-133-JDSL			82 J
10-122-JDSL			39 J
10-157-JDSL	Arsenic	Matrix Spike	380 J
10-124-JDSL			91 J
10-200-JDSL			46 J
10-198-JDSL			51 J
10-223-JDSL			67 J
10-135-JDSL	Arsenic	Matrix Spike	9.5 J
10-199-JDSL			49 J
10-197-JDSL			31 J
10-156-JDSL			81 J
10-145-JDSL			200 J

Data Validation: BHP Copper Superior Operations
Brown & Caldwell Project No. 6056.02
Sampled: February 17 - March 10, 1998
April 17, 1998

Attachment 1
Revised Laboratory Reports

Five (5) Pages Attached

Del Mar Analytical

Brown & Caldwell
3636 N. Central Ave., Suite 200
Phoenix, AZ 85012-1931
Attention: Mike Amabisco

Client Project ID: BHP Superior 4089-22
On-Site Soil
Sample Descript: Soil
First Sample #: PHC00018

Sampled: Feb 26, 1998
Received: Mar 2, 1998
Extracted: Mar 2-4, 1998
Analyzed: Mar 4-6, 1998
Reported: Mar 4-10, 1998

TOTAL ARSENIC (EPA 6010A)

Laboratory Number	Sample Description	Reporting Limit mg/Kg (ppm)	Sample Result mg/Kg (ppm)
PHC00018	10-159-JDSL	2.5	9.5 J
PHC00021	10-138-JDSL	2.5	20
PHC00022	10-149-JDSL	2.5	29
PHC00023	10-104-JDSL	2.5	70
PHC00024	10-171-JDSL	2.5	15
PHC00025	10-102-JDSL	2.5	15
PHC00026	10-148-JDSL	2.5	14
PHC00051	10-160-JDSL	2.5	190
PHC00057	10-116-JDSL	2.5	160 J
PHC00058	10-116-BDSL	2.5	150

Analytes reported as N.D. were not present at or above the reporting limit

DEL MAR ANALYTICAL, PHOENIX (AZ0426)

Beth Price
Project Manager

4/13/98

Del Mar Analytical

Brown & Caldwell
3636 N. Central Ave., Suite 200
Phoenix, AZ 85012-1931
Attention: Mike Amabisco

Client Project ID: BHP Superior 4089-22
On-Site Soil
Sample Descript: Soil
First Sample #: PHC00020

Sampled: Feb 24, 1998
Received: Mar 2, 1998
Extracted: Mar 2-4, 1998
Analyzed: Mar 4-6, 1998
Reported: Mar 10, 1998

TOTAL ARSENIC (EPA 6010A)

Laboratory Number	Sample Description	Reporting Limit mg/Kg (ppm)	Sample Result mg/Kg (ppm)
PHC00020	10-134-JDSL	2.5	190 J
PHC00048	10-144-JDSL	2.5	88
PHC00049	10-144-BDSL	2.5	89
PHC00052	10-133-JDSL	2.5	82 J

Analytes reported as N.D. were not present at or above the reporting limit

DEL MAR ANALYTICAL, PHOENIX (AZ0426)

Beth Price
Project Manager

4/14/98

Del Mar Analytical

Brown & Caldwell
3636 N. Central Ave., Suite 200
Phoenix, AZ 85012-1931
Attention: Mike Amabisco

Client Project ID: BHP Superior 4089-22
On-Site Soil
Sample Descript: Soil
First Sample #: PHC00017

Sampled: Feb 25, 1998
Received: Mar 2, 1998
Extracted: Mar 2-4, 1998
Analyzed: Mar 4-12, 1998
Reported: Mar 4-16, 1998

TOTAL ARSENIC (EPA 6010A)

Laboratory Number	Sample Description	Reporting Limit mg/Kg (ppm)	Sample Result mg/Kg (ppm)
PHC00017	10-122-JDSL	2.5	39 J
PHC00019	10-157-JDSL	2.5	39 J
PHC00027	10-124-JDSL	2.5	88
PHC00028	10-124-BDSL	2.5	91 J
PHC00029	10-200-JDSL	2.5	46 J
PHC00030	10-198-JDSL	2.5	51 J
PHC00032	10-202-JDSL	2.5	46
PHC00033	10-223-JDSL	2.5	67 J
PHC00034	10-166-JDSL	2.5	51

Analytes reported as N.D. were not present at or above the reporting limit.

DEL MAR ANALYTICAL, PHOENIX (AZ0426)

Beth Price
Project Manager

4/12/98

Del Mar Analytical

Brown & Caldwell
3636 N. Central Ave., Suite 200
Phoenix, AZ 85012-1931
Attention: Mike Amabisco

Client Project ID: BHP Superior 4089-22
On-Site Soil
Sample Descript: Soil
First Sample #: PHC00035

Sampled: Feb 25, 199E
Received: Mar 2, 199E
Extracted: Mar 2-4, 199E
Analyzed: Mar 4-12, 199E
Reported: Mar 4-16, 199E

TOTAL ARSENIC (EPA 6010A)

Laboratory Number	Sample Description	Reporting Limit mg/Kg (ppm)	Sample Result mg/Kg (ppm)
PHC00035	10-146-JDSL	2.5	150
PHC00036	10-155-JDSL	2.5	340
PHC00037	10-135-JDSL	2.5	9.5 J
PHC00039	10-127-JDSL	2.5	4.1
PHC00040	10-203-JDSL	2 5	24
PHC00041	10-125-JDSL	2.5	76
PHC00042	10-199-JDSL	2 5	49 J
PHC00043	10-204-JDSL	2.5	13

Analytes reported as N.D. were not present at or above the reporting limit.

DEL MAR ANALYTICAL, PHOENIX (AZ0426)

Beth Price
Project Manager

Del Mar Analytical

Brown & Caldwell
3636 N. Central Ave., Suite 200
Phoenix, AZ 85012-1931
Attention: Mike Amabisco

Client Project ID: BHP Superior 4089-22
On-Site Soil
Sample Descript: Soil
First Sample #: PHC00044

Sampled: Feb 25, 1998
Received: Mar 2, 1998
Extracted: Mar 2-4, 1998
Analyzed: Mar 4-6, 1998
Reported: Mar 6-10, 1998

TOTAL ARSENIC (EPA 6010A)

Laboratory Number	Sample Description	Reporting Limit mg/Kg (ppm)	Sample Result mg/Kg (ppm)
PHC00044	10-197-JDSL	2.5	31 J
PHC00045	10-114-JDSL	2.5	68
PHC00046	10-103-JDSL	2.5	31
PHC00047	10-156-JDSL	2.5	81 J
PHC00050	10-167-JDSL	2.5	490
PHC00053	10-145-JDSL	2.5	200 J
PHC00054	10-168-JDSL	2.5	20
PHC00055	10-168-BDSL	2.5	23
PHC00056	10-182-JDSL	2.5	330

Analytes reported as N.D. were not present at or above the reporting limit.

DEL MAR ANALYTICAL, PHOENIX (AZ0426)

Beth Price
Project Manager

4/12/98

Attachment 2

Communications with the Laboratory

Quality By Design
97 Puhili Street
Hilo, Hawaii 96720
Phone: (808) 969-9424 Fax: (808) 969-9094
e-Mail: qbdhilo@gte.net

FACSIMILE TRANSMISSION SHEET

Date: April 11, 1998

Fax #: 602/968-3401

To: Del Mar Analytical
Attn: Beth Price, Project Manager
June Baker, Quality Assurance Manager

From: Lorraine Davis

Total Pages, including this one: 2

We are reviewing the data for Brown and Caldwell for the following Del Mar Analytical, Inc. analytical report numbers:

PHC00634	HC00149
PHC00789	HC00405
PHC00705	PHC00285
PHC00709	PHC00434
PHC00273	PHC00498
PHC00290	PHC00017

In our review process, we have found the following items, which we need help in clarifying. If you find that the report must be revised, will you please send the revision directly to Mike Amabisco at Brown and Caldwell and fax a copy of the corrected page(s) to us at the above number?

- There is a possible error with the laboratory ID for Sample No. 10-158-JDSL on pages 26 and 309 of data package HC00443. The lab has given this sample name the identification name of HC00453 and HC00532. Since there is no cross reference to the chain of custody, the reviewer cannot determine which laboratory identification number is correct.

- There is no laboratory receiving signature for data package HC00130. Is there anything available showing the date and time the laboratory received the samples which can be included in the report?

- The laboratory signature for data package HC00443 shows a break in custody between the date and time relinquished to the date and time received. There is no indication in the package that a courier or express service was used. Is there anything available showing the samples were received by a courier or express service that would account for the break in the custody?

- There is a possible sample ID error on page 39 of data package HC00443. Shouldn't the Sample HC00445 be labeled as 10-207-JDSL?

- The Initial and Continuing Calibration Report for data package PHC00434, analysis date 3/10/98 was not provided. I have checked the raw data and everything met criteria. Could a summary report be issued to Brown and Caldwell to complete the data package?

- The Corrective Action Form for Data Package PHC00017 states that analysis run on 3/5/98 had an LCS copper result of 168%. The Laboratory Control Standard Report sheet and the raw data show the analysis date of 3/6/98.

- For Data Package HC00130, page 28, there was a transcription error for the Copper MS result. The value should read 34,000, not 3400. The correction results in acceptable relative percent difference (RPD) for the spike and spike duplicate.

If you have any questions, please don't hesitate to call me at the number listed on the cover of this fax. Thank you for your assistance.

cc: Mike Amabisco, Brown and Caldwell 602/222-4466

Send Hard Copy? ___ Yes _XX_ No

Del Mar Analytical

2852 Alton Ave., Irvine, CA 92606 (714) 261-1022 FAX (714) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (909) 370-1046
16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Facsimile Cover Sheet

To: Lorraine Davis
Company: Quality by Design
Fax: 808-969-0594

From: Beth Price
Company: Del Mar Analytical
Phone: (602) 968-8272
Fax: (602) 968-3401

Date: 4/14/98
Pages including this cover page: 2

Comments:

Lorraine -

Following is the Initial & Continuing Calibration Report for data package PNC00434. This page is numbered 000018 in this package. I will have more results/answers for you tomorrow.

Thanks - Beth

Del Mar Analytical

CALIBRATION VERIFICATION SUMMARY

Analysis Dates: ICP: 3/10/98 GFAA: Hg:
Methods: EPA 6010

Concentration Units: mg/L

Analyte	Initial Calibration			Continuing Calibration							M
	Conc.	Result	%R	Conc.	Result	%R	Result	%R	Result	%R	
Aluminum	10			10							P
Antimony	1.0			1.0							P
Arsenic	1.0	1.01	101	1.0	1.02	102	1.02	102			F
Barium	1.0			1.0							P
Beryllium	1.0			1.0							P
Boron	1.0			1.0							P
Cadmium	1.0			1.0							P
Calcium	10			10							P
Chromium	1.0			1.0							P
Cobalt	1.0			1.0							P
Copper	1.0	0.976	98	1.0	0.996	100	0.996	100			P
Iron	10			10							P
Lead	1.0			1.0							P
Magnesium	10			10							P
Manganese	1.0			1.0							P
Mercury	0.0050			0.0050							CV
Molybdenum	1.0			1.0							P
Nickel	1.0			1.0							P
Phosphorus	10			10							P
Potassium	10			10							P
Selenium	0.025			0.025							F
Silica	21.39			21.39							P
Silver	0.50			0.50							P
Sodium	10			10							P
Thallium	0.0125			0.0125							F
Vanadium	1.0			1.0							P
Zinc	1.0			1.0							P

Control Limits: Mercury 80-120
ICP: ICV 95-105, CCV 90-110
GFAA: ICV/CCV 90-110

Method Codes: P=ICP F = GFAA CV = Cold Vapor

Del Mar Analytical

2852 Alton Ave. Irvine CA 92606 (714) 261-1022 FAX (714) 261-1228
1014 E. Cooley Dr., Suite A Colton CA 92324 (909) 370-4667 FAX (909) 370-1046
5525 Sherman Way Suite C-11 Van Nuys CA 91406 (818) 779-1844 FAX (818) 779-1843
2465 W. 12th St. Suite Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-3401

Facsimile Cover Sheet

To: Lorraine Davis
Company: Quality by Design
Fax: 808-949-9094

From: Beth Price
Company: Del Mar Analytical
Phone: (602) 968-8272
Fax: (602) 968-3401

Date: 4/15/98
Pages including this cover page: 2

Comments:

Lorraine -
Following is the corrected HS/HSO for Copper for data package HC00130. BAC. Apologies for the error.

Beth

*** CONFIDENTIALITY NOTICE***

Del Mar Analytical

2852 Alton Ave., Irvine, CA 92606 (714) 261-1022 FAX (714) 261-1228
1014 E. Cooley Dr. Suite A, Colton, CA 92324 (909) 370-4667 FAX (909) 370-1046
5325 Sherman Way, Suite C-11, Van Nuys, CA 91405 (818) 779-1844 FAX (818) 779-1843
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (619) 505-9596 FAX (619) 505-9689
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1401

[redacted]

METHOD Metals
Instrument: ICP
Matrix: Soil

Date: 3/3/98

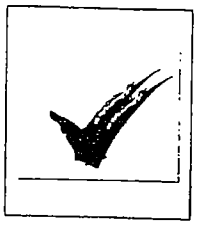
Sample #: HC00132

Analyte	R1	SP	MS	MSD	PR1	PR2	RPD	MEAN PR
	ppm	ppm	ppm	ppm	%	%	%	%
Arsenic*	2300	50	2400	2400	200%	200%	0.0%	200%
Copper*	35000	50	34000	35000	0%	0%	2.9%	0%

R1. . . . . Result of Sample Analysis
Sp. . . . . Spike Concentration Added to Sample
MS. . . . . Matrix Spike Result
MSD. . . . . Matrix Spike Duplicate Result
PR1. . . . . Percent Recovery of MS; ((MS-R1) / SP) X 100
PR2. . . . . Percent Recovery of MSD; ((MSD-R1) / SP) X 100
RPD. . . . . Relative Percent Difference; ((MS-MSD)/((MS+MSD)/2)) X 100

QA/QC CRITERIA: *QC was outside of acceptance limits due to matrix interference. See LCS for batch validation.

Del Mar Analytical



Quality By Design
97 Puhili Street
Hilo, Hawaii 96720
Phone: (808) 969-9424 Fax: (808) 969-9094
e-Mail: qbdhilo@gte.net

FACSIMILE TRANSMISSION SHEET

Date: April 13, 1998 Fax #: 602/968-3401

To: Del Mar Analytical From: Thomas Davis

Attn: Beth Price Total Pages, including this one: 1

As we mentioned in yesterday's fax, we are reviewing the data from Brown and Caldwell's BHP Superior metals analyses. In our data package, we are unable to locate the graphite furnace reports for Arsenic for Samples No. PCH 00031 (B&C No. 10-201-JDSL) and PCH00038 (B&C No. 10-126-JDSL). The QC data is present and the raw data for GFAA is included, but the sample results are not. Could you please fax a copy of this report to the letterhead phone and send a hard copy direct to Mike Amabisco at Brown and Caldwell?

Thank you for your help. If there are any questions, please call.

cc: Mike Amabisco, Brown & Caldwell

Send Hard Copy? ____ Yes __XX__ No

Del Mar Analytical

2852 Alton Ave., Irvine, CA 92606 (714) 261-1022 FAX (714) 261-1228
1015 E. Cooley Dr., Suite A, Colton CA 92324 (909) 370-4667 FAX (909) 370-1045
6525 Sherman Way, Suite C-11 Van Nuys, CA 91405 (818) 779-1844 FAX (818) 779-1843
2465 W. 12th St., Suite I, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Facsimile Cover Sheet

To: Thomas Davis
Company: Quality by Design
Fax: 808-946-9094

From: Beth Price
Company: Del Mar Analytical
Phone: (602) 968-8272
Fax: (602) 968-3401

Date: 4/14/98
Pages including this cover page: 2

Comments:

Thomas,

Following are the graphite furnace Results for Arsenic for samples PHC 00031 & 38. They were identified as page 00015 in the data package.

Beth

Del Mar Analytical

2852 Alton Ave., Irvine, CA 92606 (714) 261-1022 FAX (714) 261-1228
514 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (909) 370-1046
16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-5401

Brown & Caldwell	Client Project ID:	BHP Superior 4089-22	Sampled: Feb 25, 1998
3636 N. Central Ave., Suite 200		On-Site Soil	Received: Mar 2, 1998
Phoenix, AZ 85012-1931	Sample Descript:	Soil	Extracted: Mar 2-4, 1998
Attention: Mike Amabisco	First Sample #:	PHC00031	Analyzed: Mar 4-12, 1998
			Reported: Mar 4-16, 1998

TOTAL ARSENIC (EPA 7060A)

Laboratory Number	Sample Description	Reporting Limit mg/Kg (ppm)	Sample Result mg/Kg (ppm)
PHC00031	10-201-JDSL	2.5	44
PHC00038	10-126-JDSL	2.5	1.8

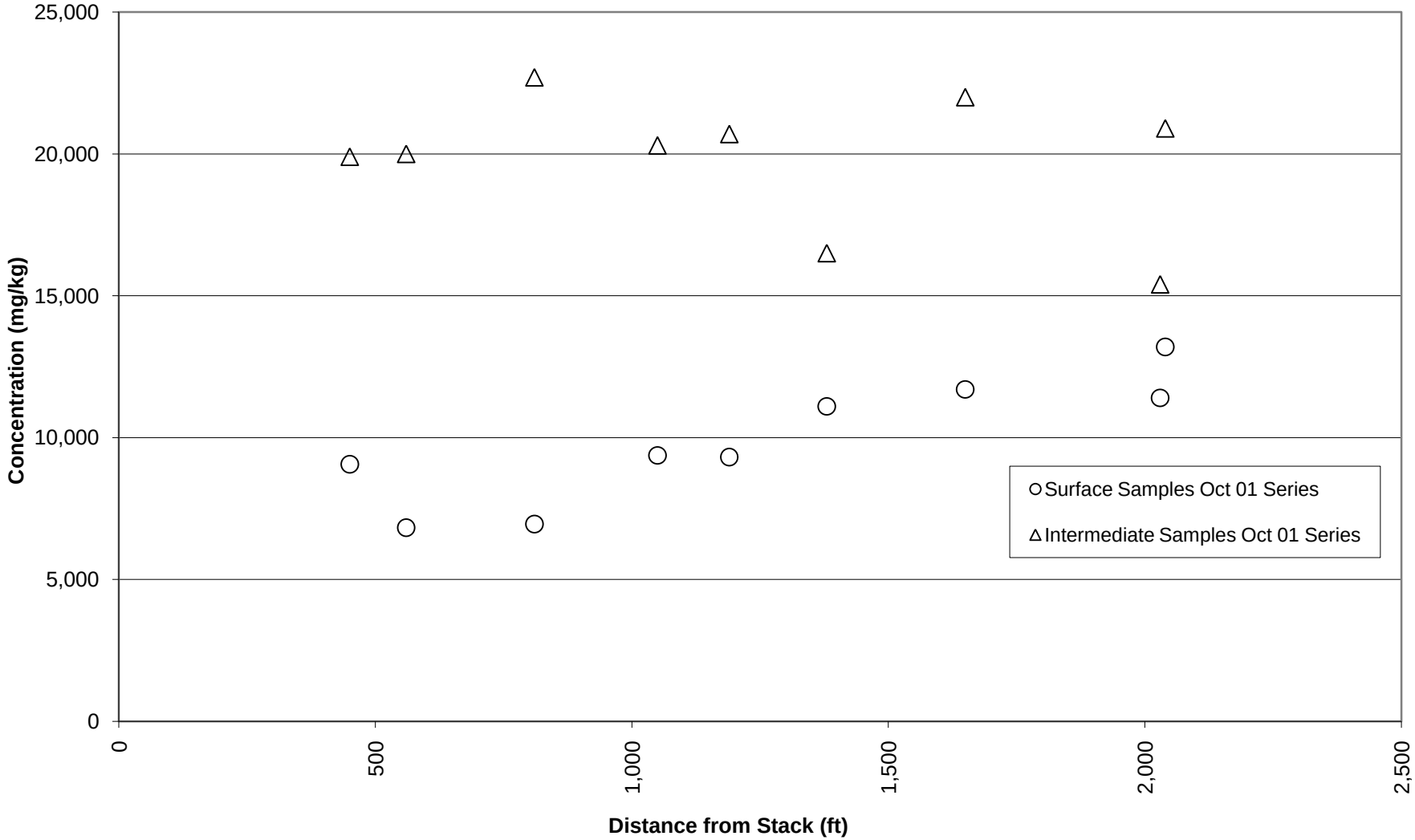
Analytes reported as N.D. were not present at or above the reporting limit.

DEL MAR ANALYTICAL, PHOENIX (AZ0426)

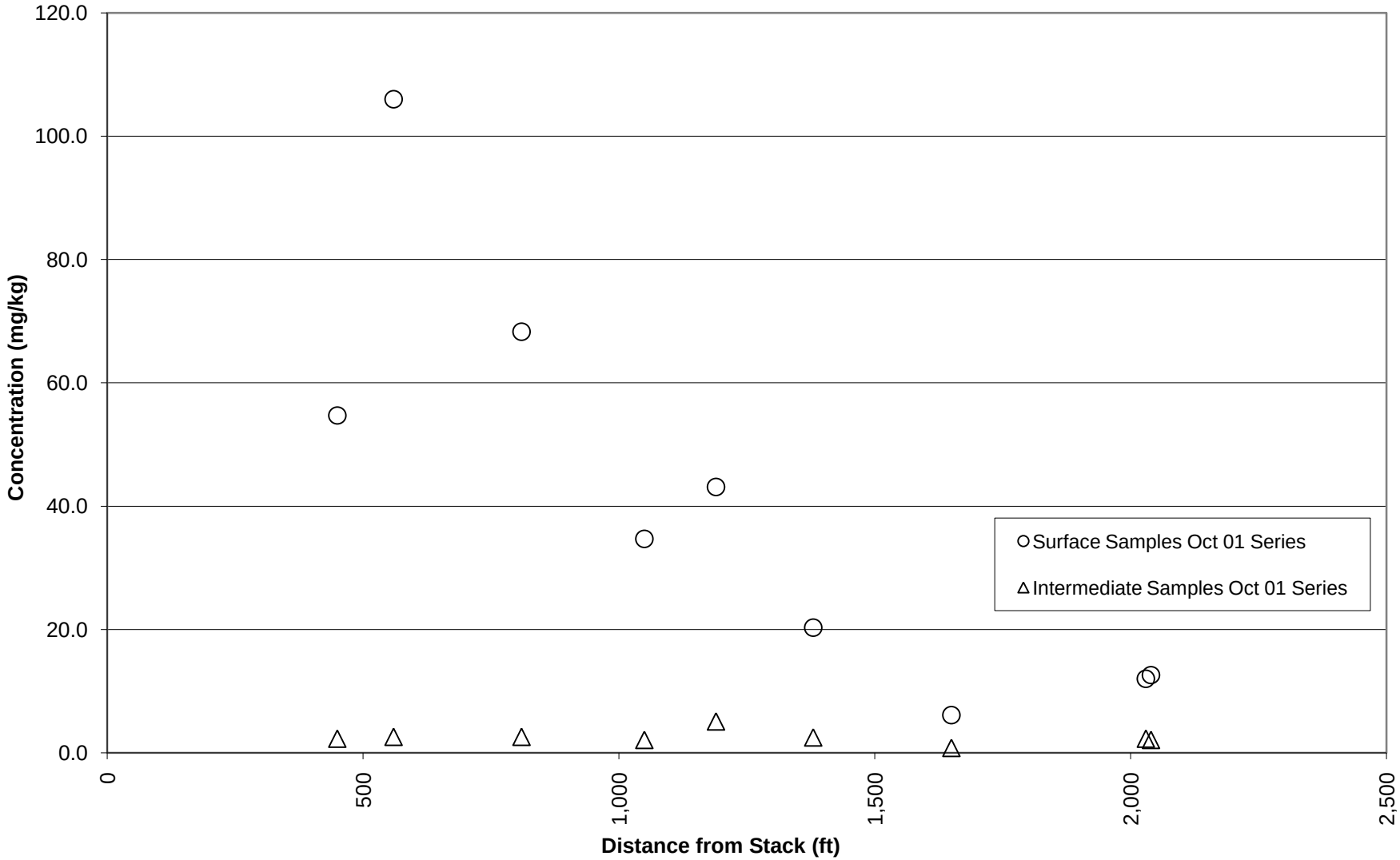
Beth Price
Project Manager

Appendix A4
Exploratory Data Analysis for Soil Metals Data
Additional Plots of Concentration with Distance
Additional Cross Plots of Concentration by Soil Layer

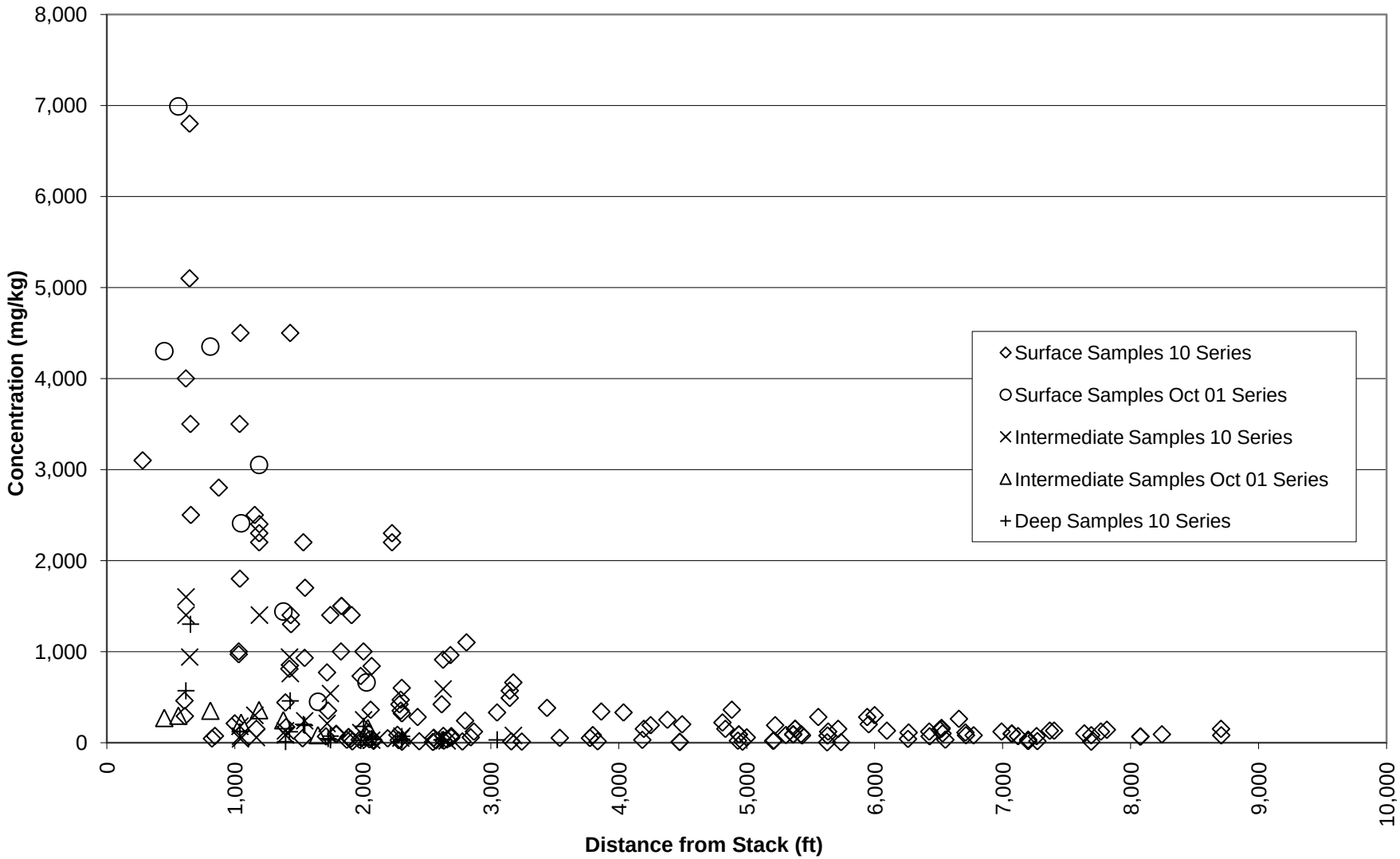
Aluminum Concentrations vs Distance from Stack



Antimony Concentrations vs Distance from Stack

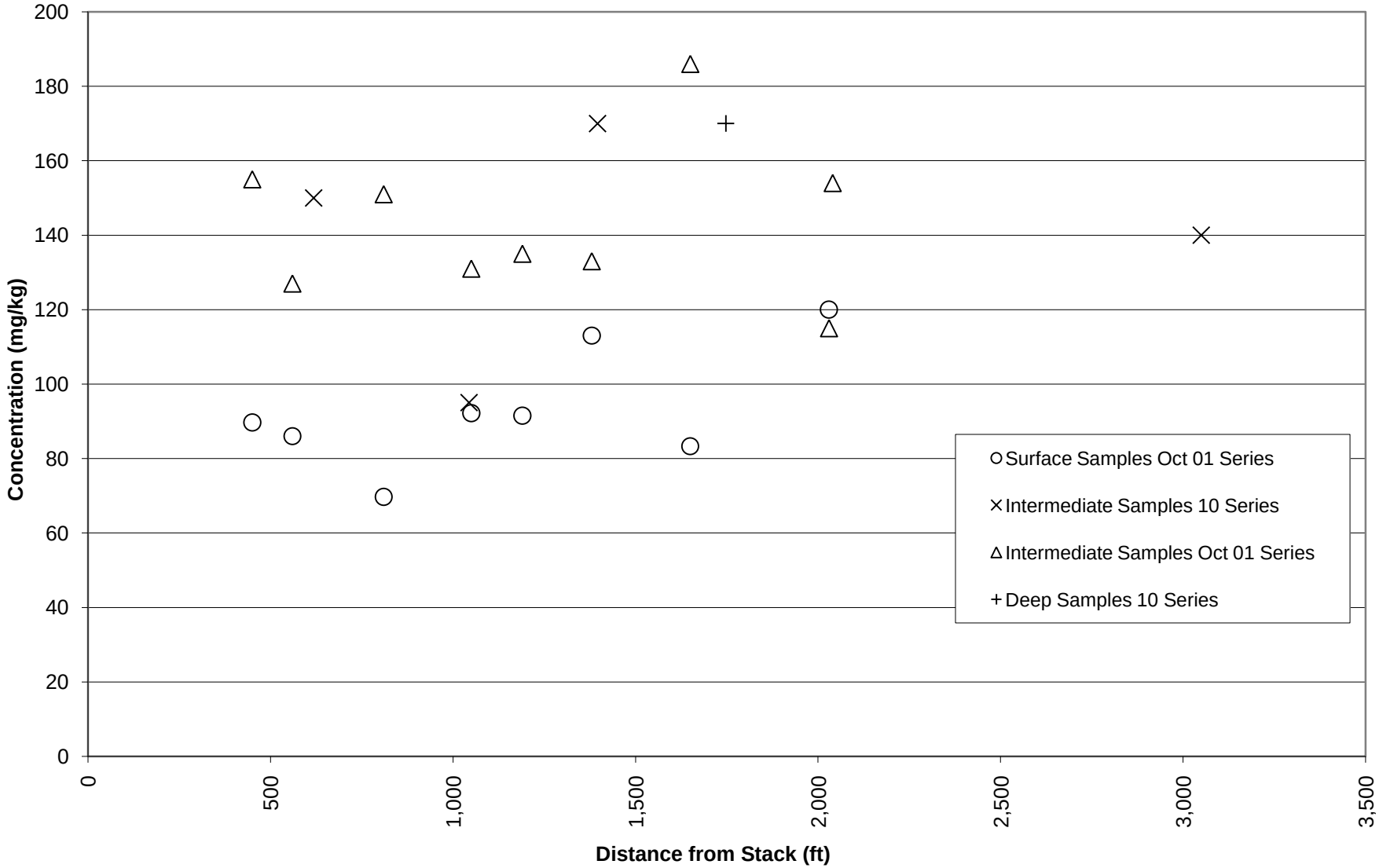


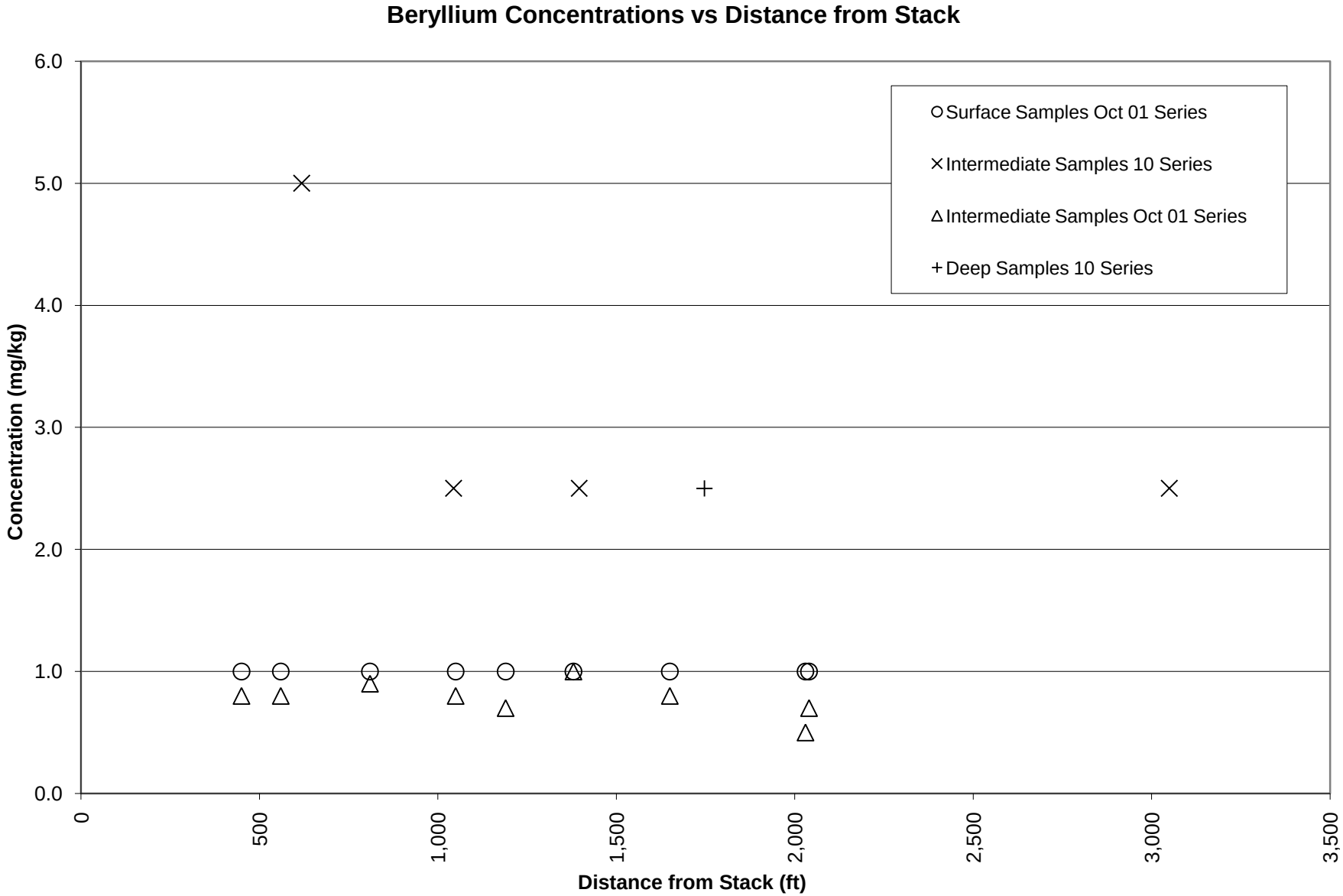
Arsenic Concentrations vs Distance from Stack



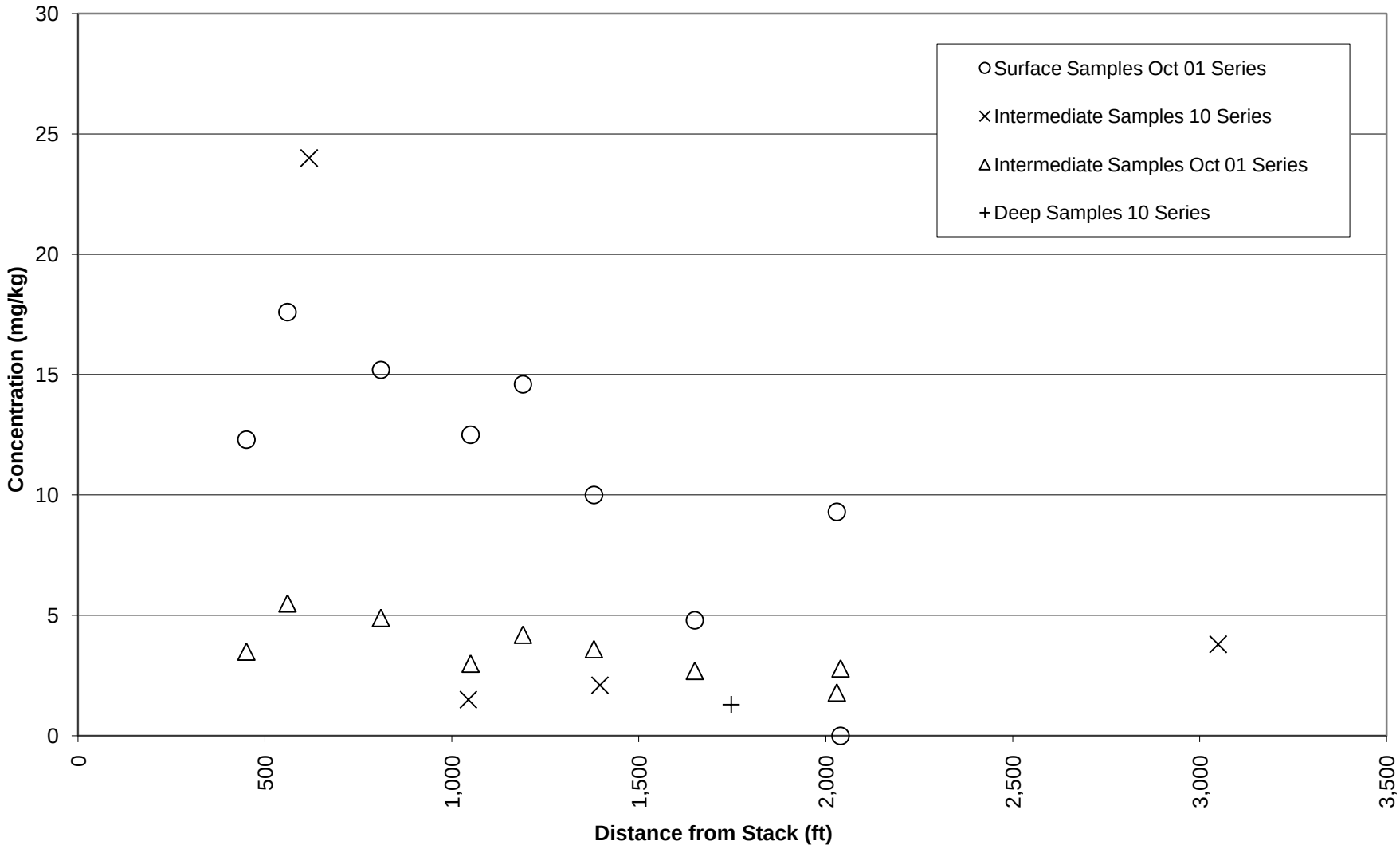
Golder Associates

Barium Concentrations vs Distance from Stack

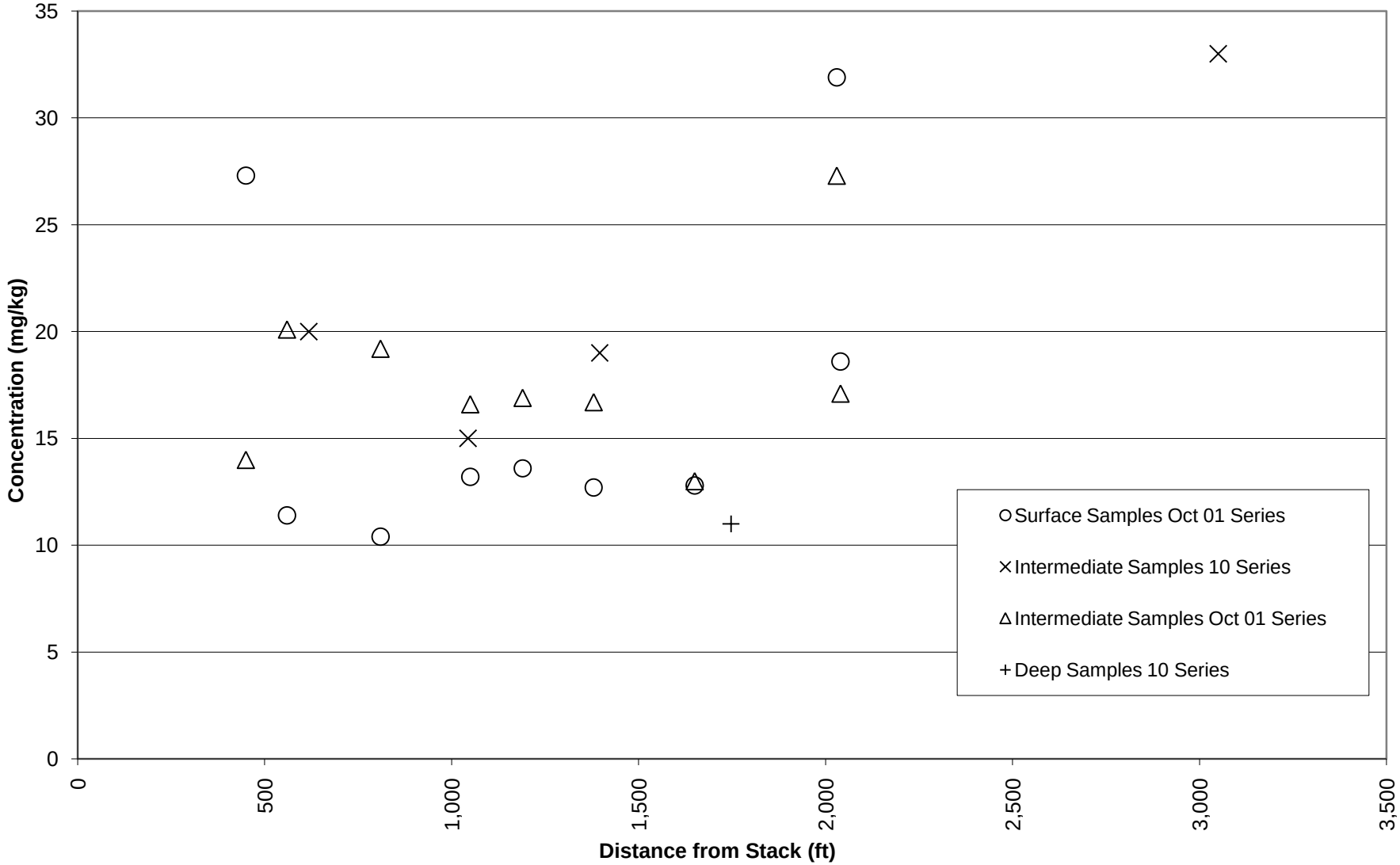



Beryllium Concentrations vs Distance from Stack
Concentration (mg/kg)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0
500
1,000
1,500
2,000
2,500
3,000
3,500
Distance from Stack (ft)
Surface Samples Oct 01 Series
Intermediate Samples 10 Series
Intermediate Samples Oct 01 Series
Deep Samples 10 Series

Cadmium Concentrations vs Distance from Stack

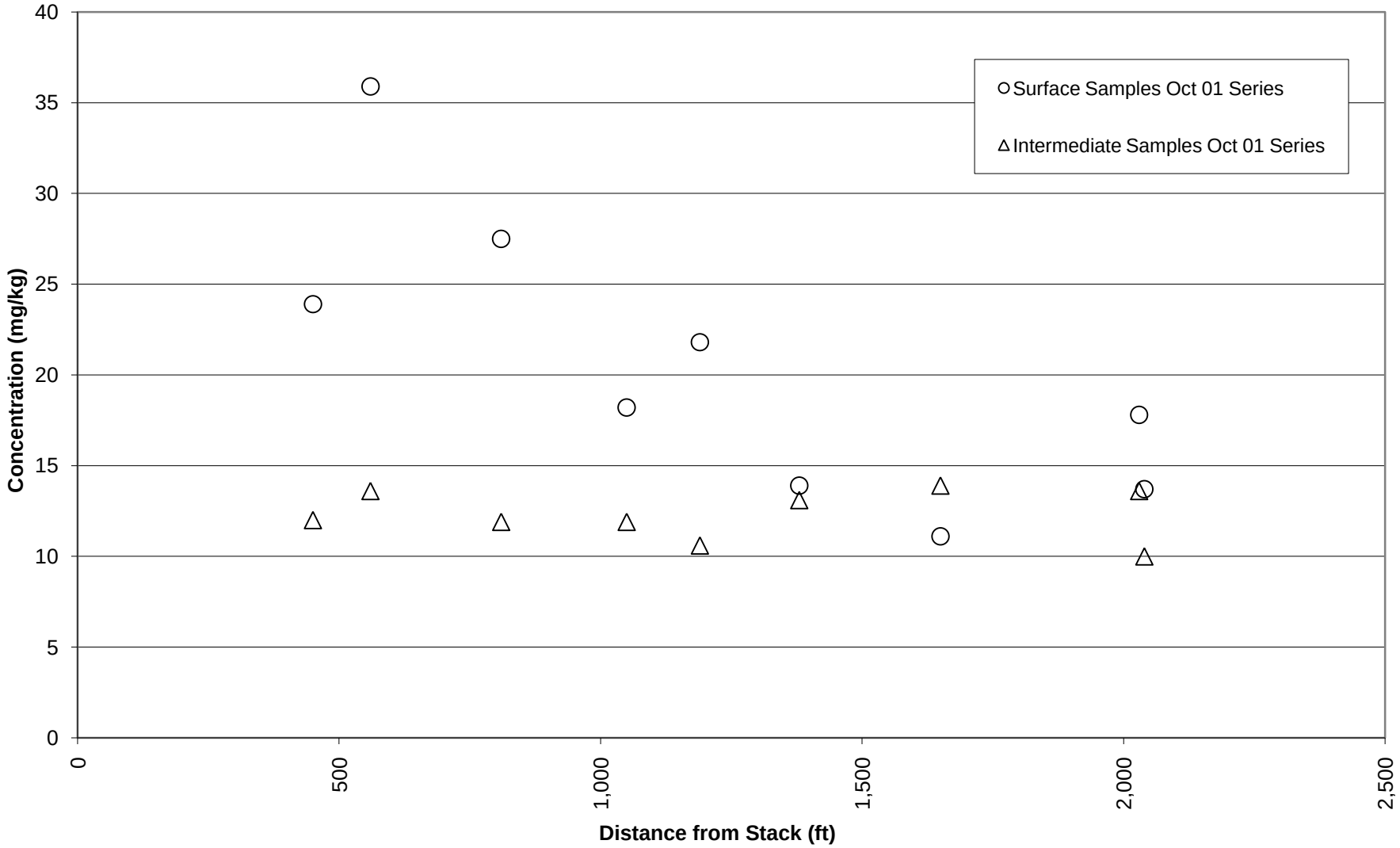


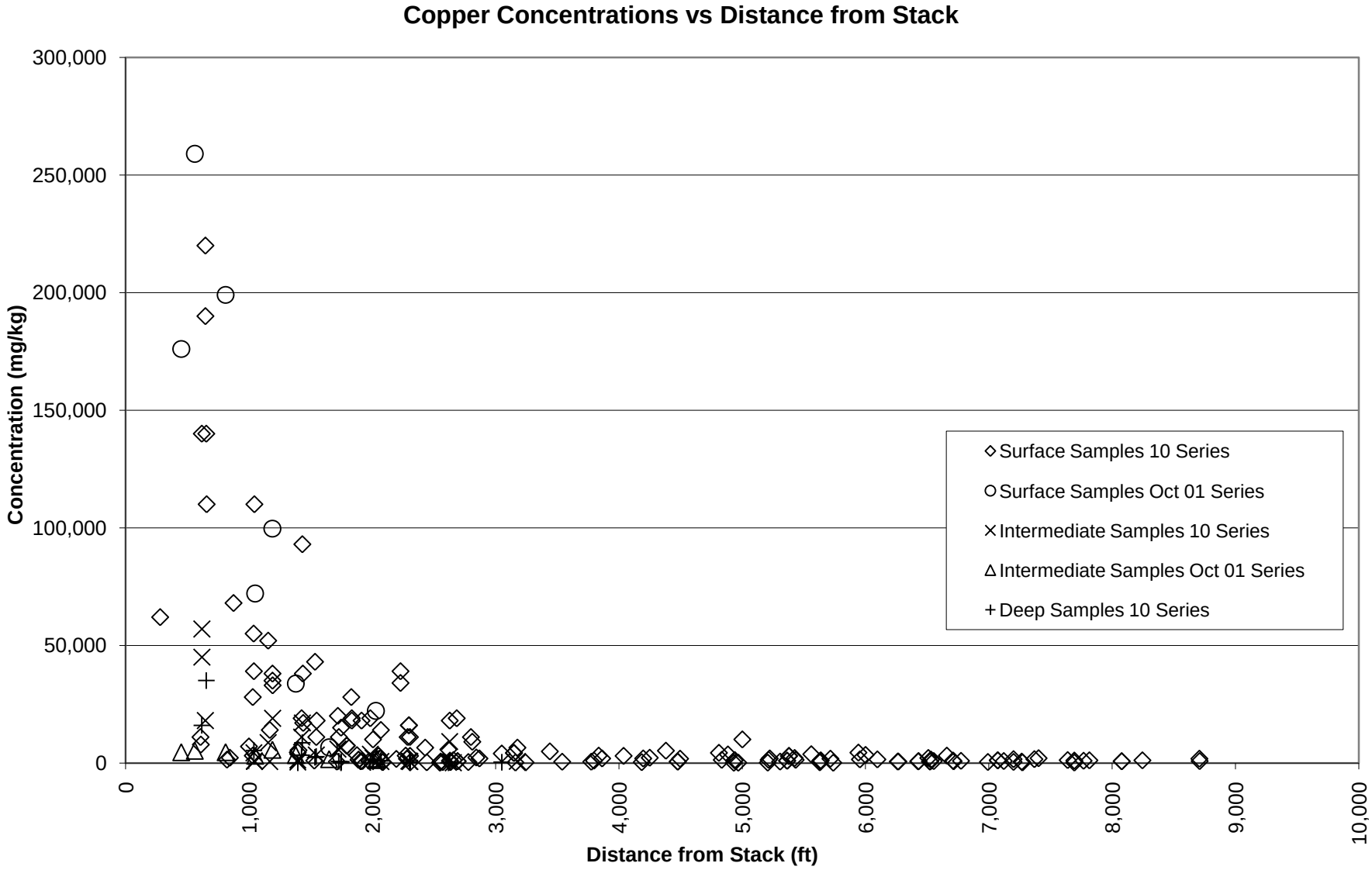
Chromium Concentrations vs Distance from Stack

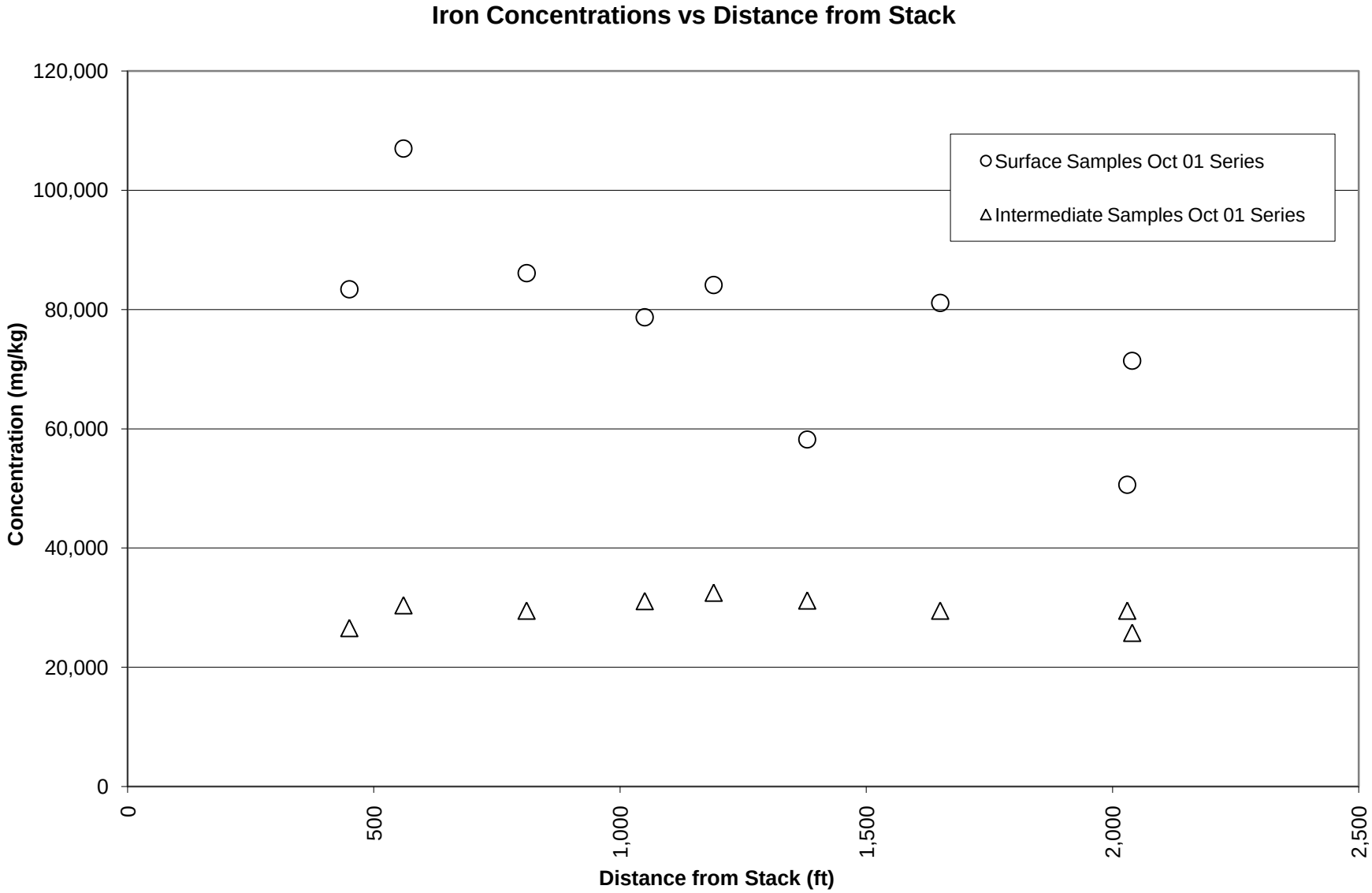


Golder Associates

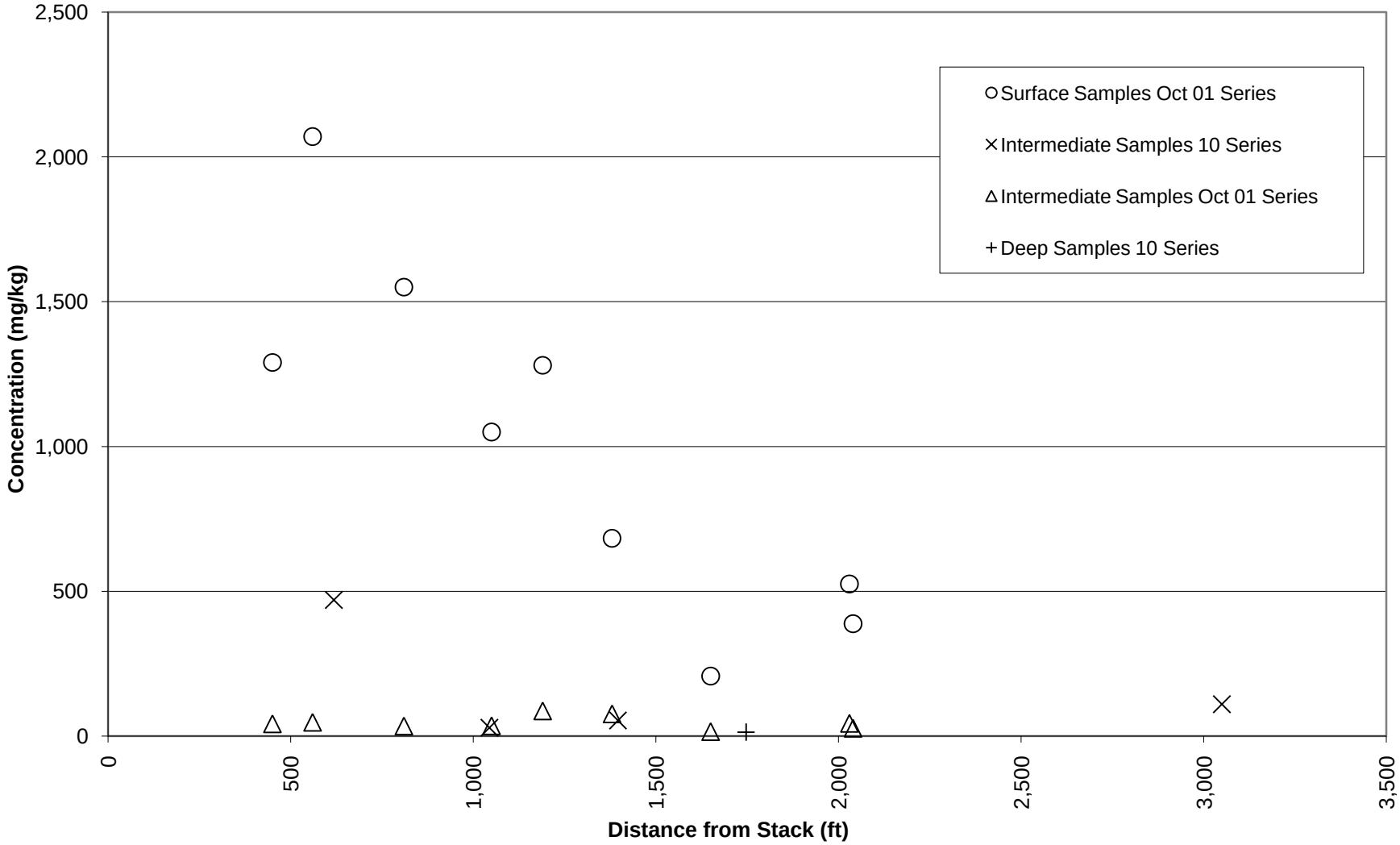
Cobalt Concentrations vs Distance from Stack



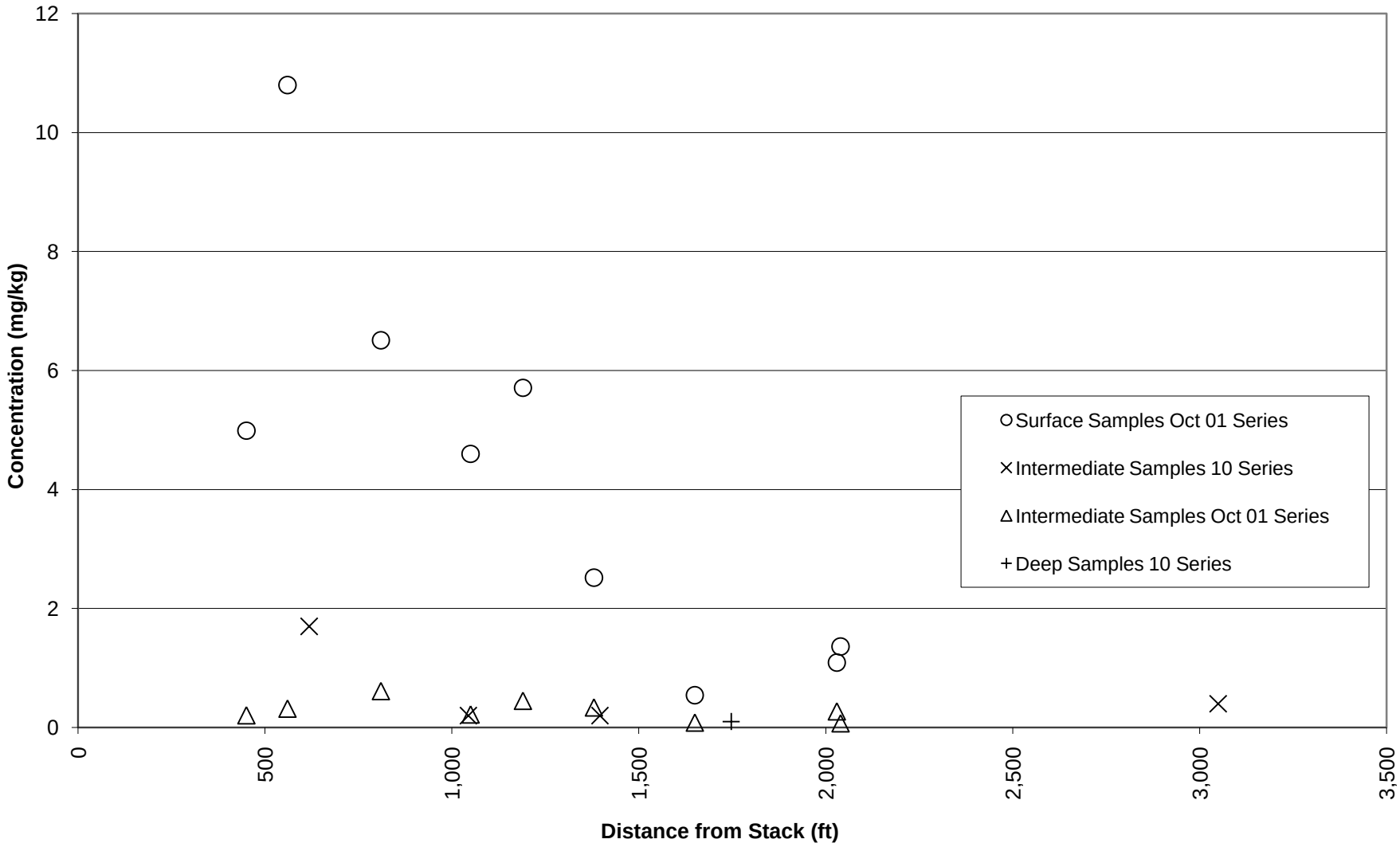

Copper Concentrations vs Distance from Stack
Concentration (mg/kg)
300,000
250,000
200,000
150,000
100,000
50,000
0
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
Distance from Stack (ft)
Surface Samples 10 Series
Surface Samples Oct 01 Series
Intermediate Samples 10 Series
Intermediate Samples Oct 01 Series
Deep Samples 10 Series


Iron Concentrations vs Distance from Stack
120,000
100,000
80,000
60,000
40,000
20,000
0
Concentration (mg/kg)
0
500
1,000
1,500
2,000
2,500
Distance from Stack (ft)
Surface Samples Oct 01 Series
Intermediate Samples Oct 01 Series

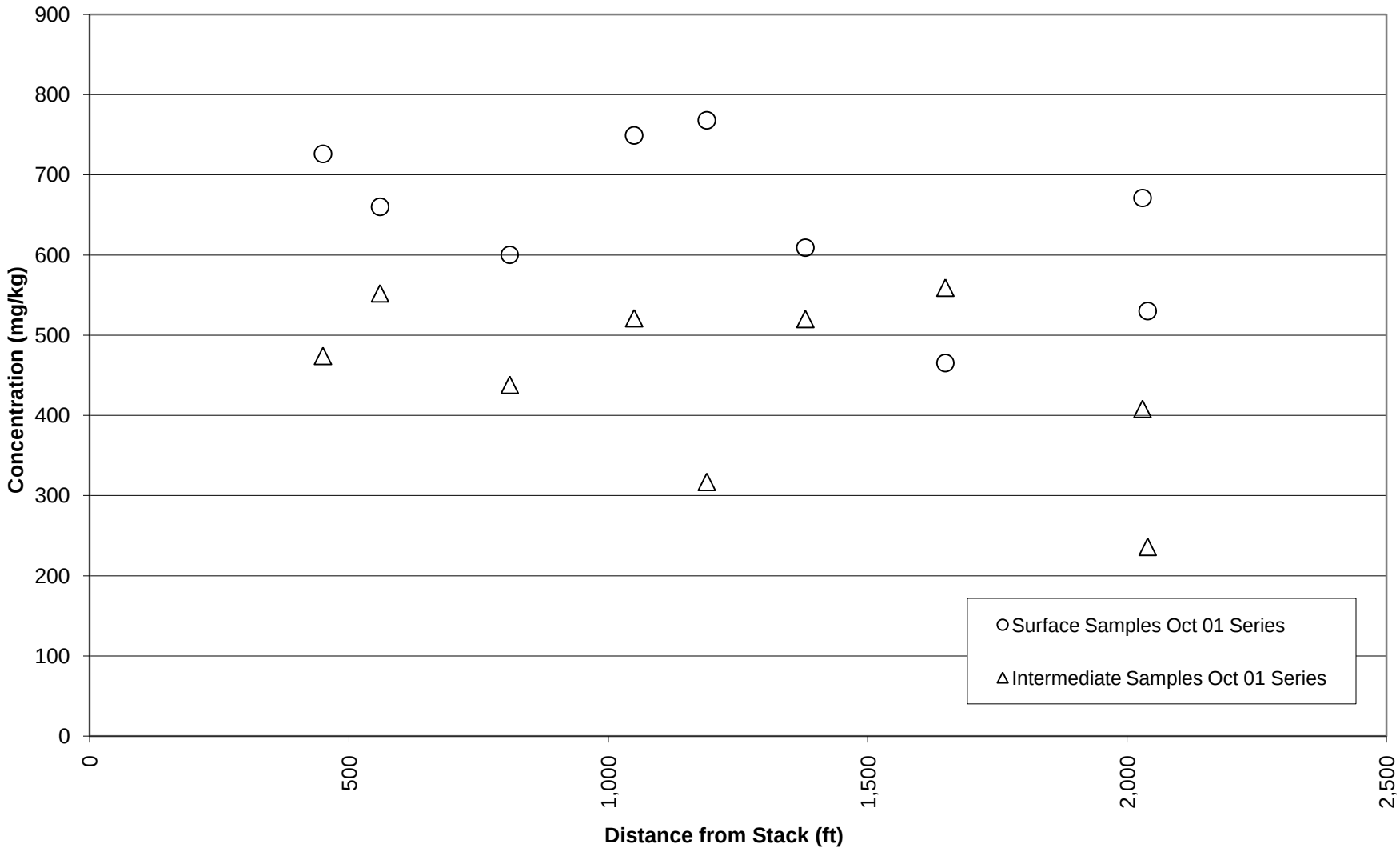
Lead Concentrations vs Distance from Stack



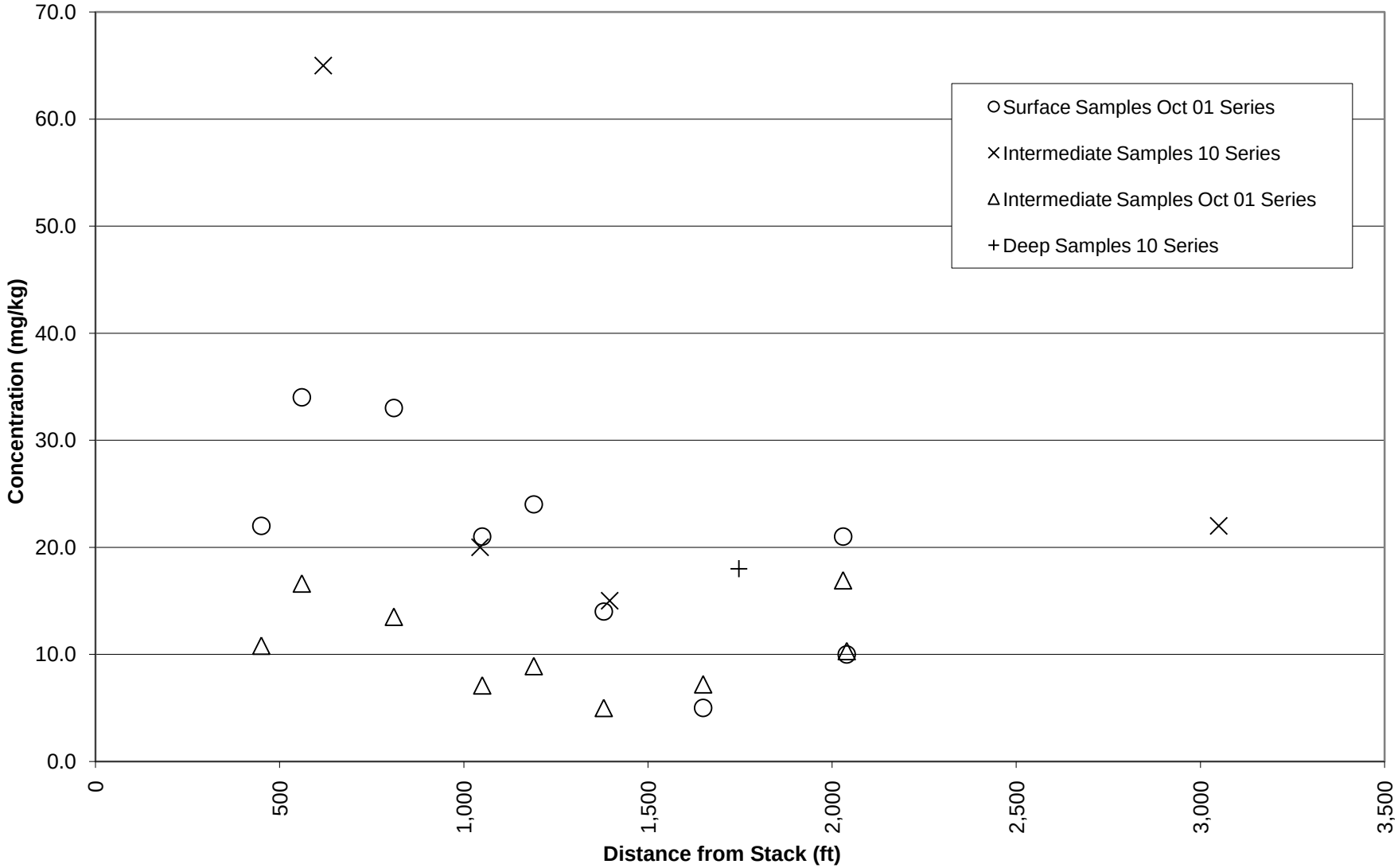
Mercury Concentrations vs Distance from Stack



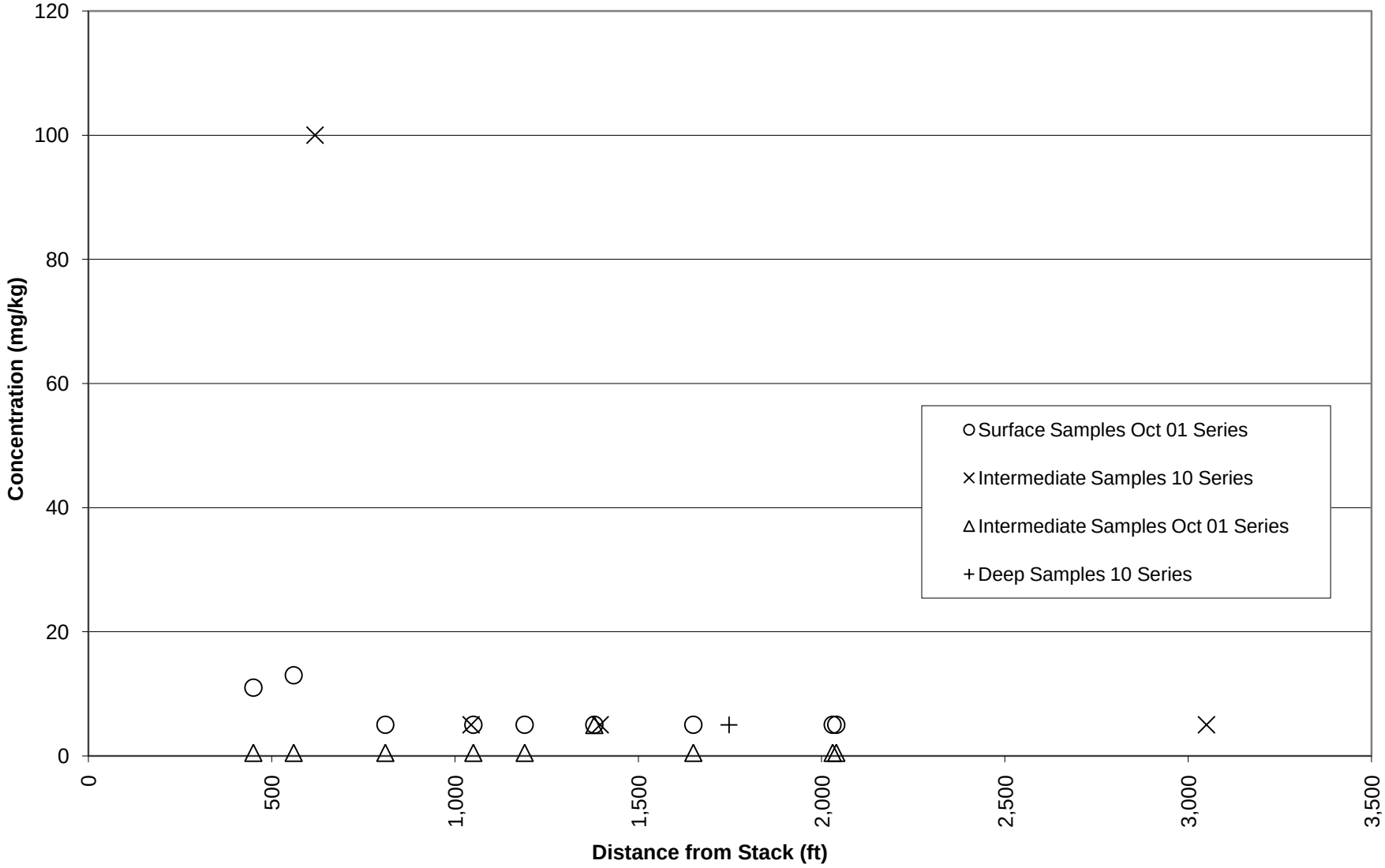
Manganese Concentrations vs Distance from Stack



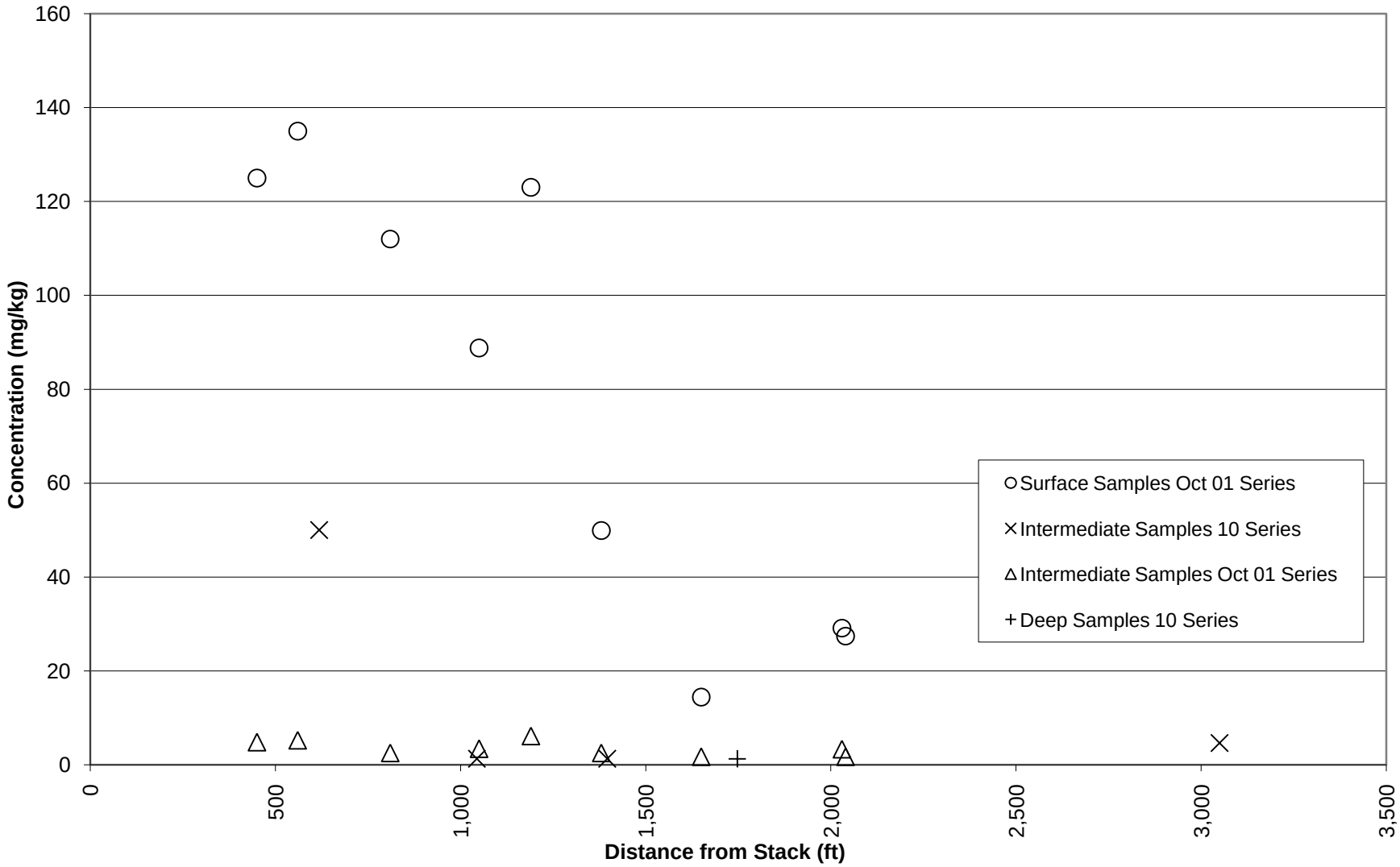
Nickel Concentrations vs Distance from Stack

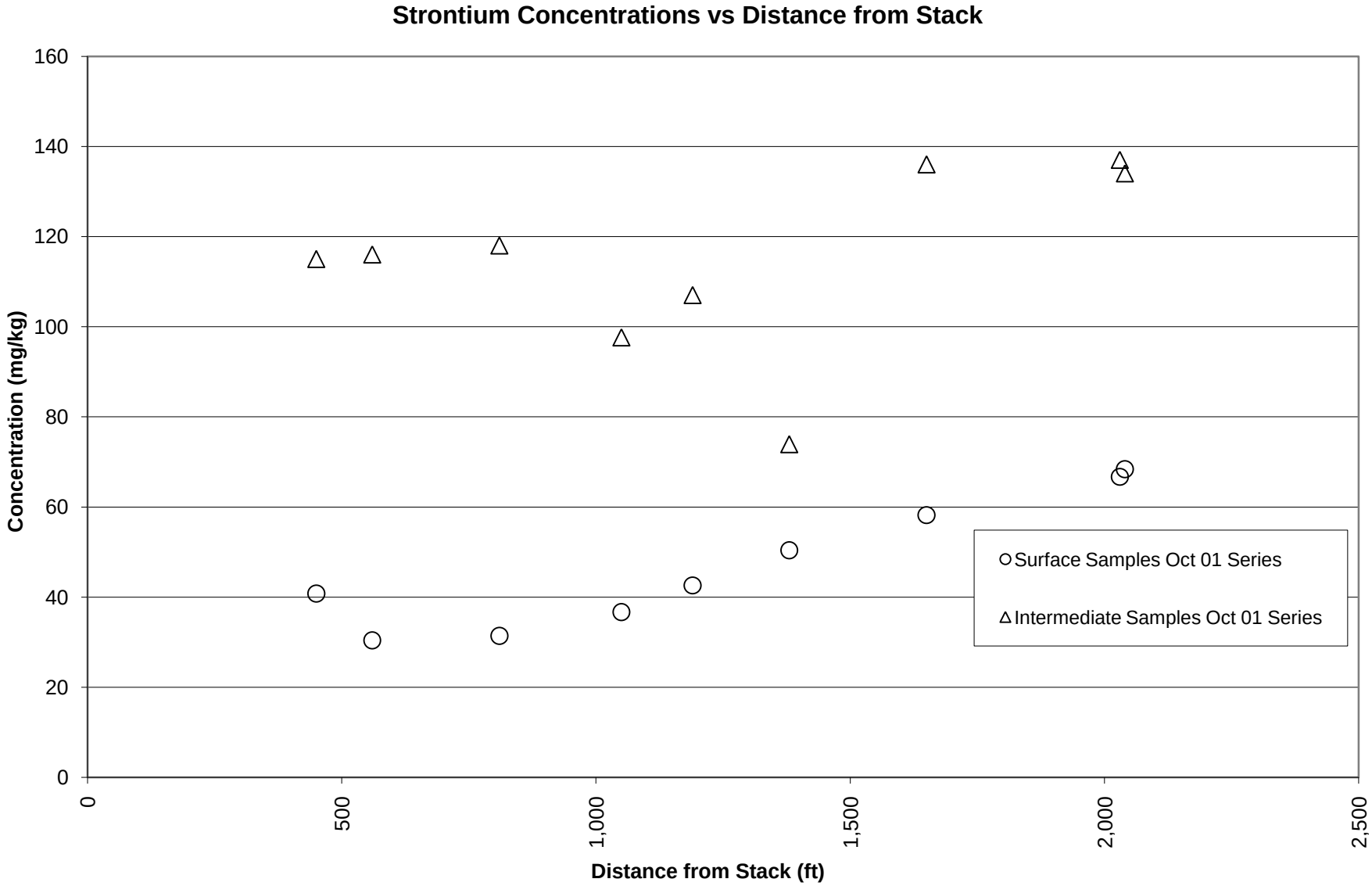


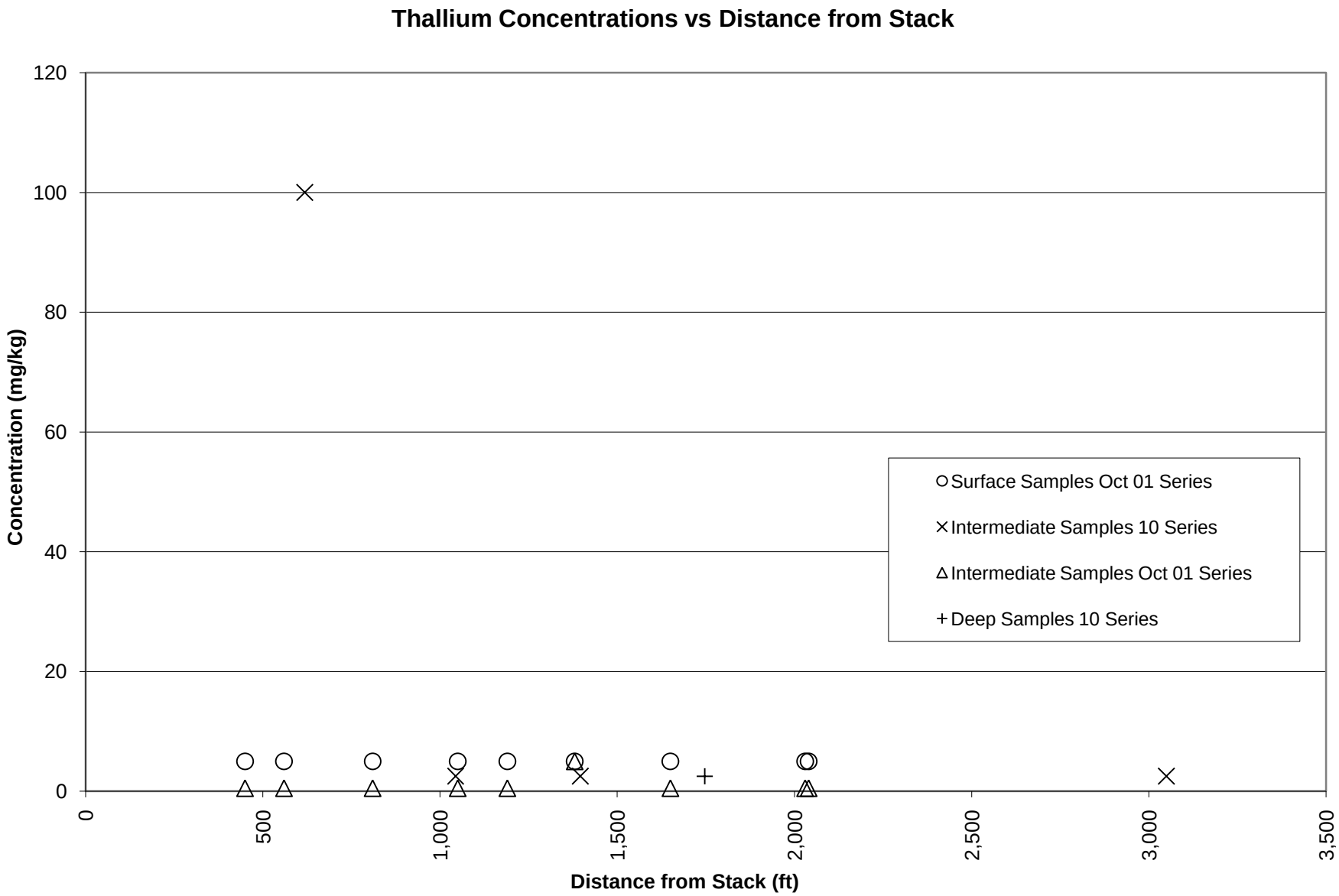
Selenium Concentrations vs Distance from Stack

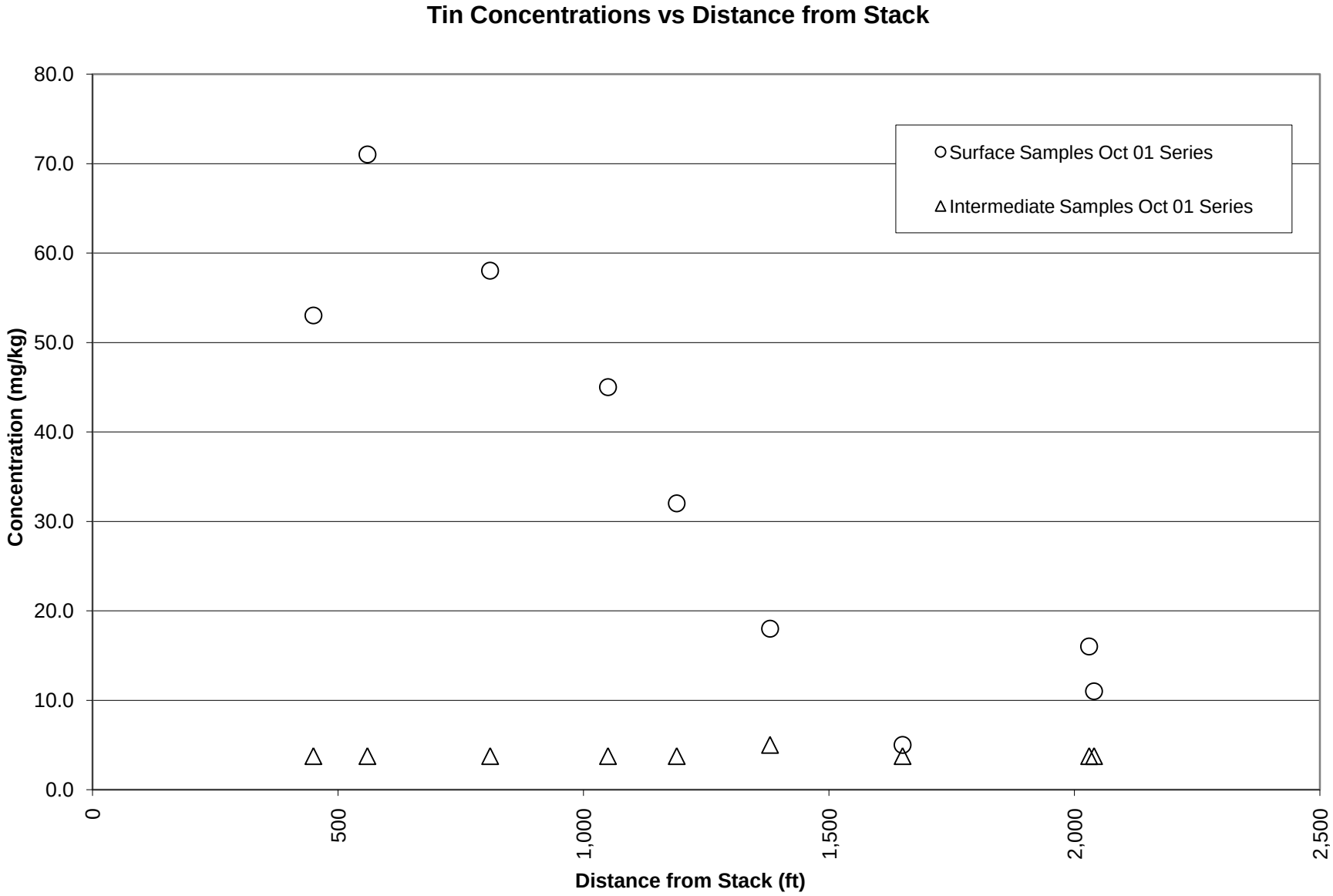


Silver Concentrations vs Distance from Stack

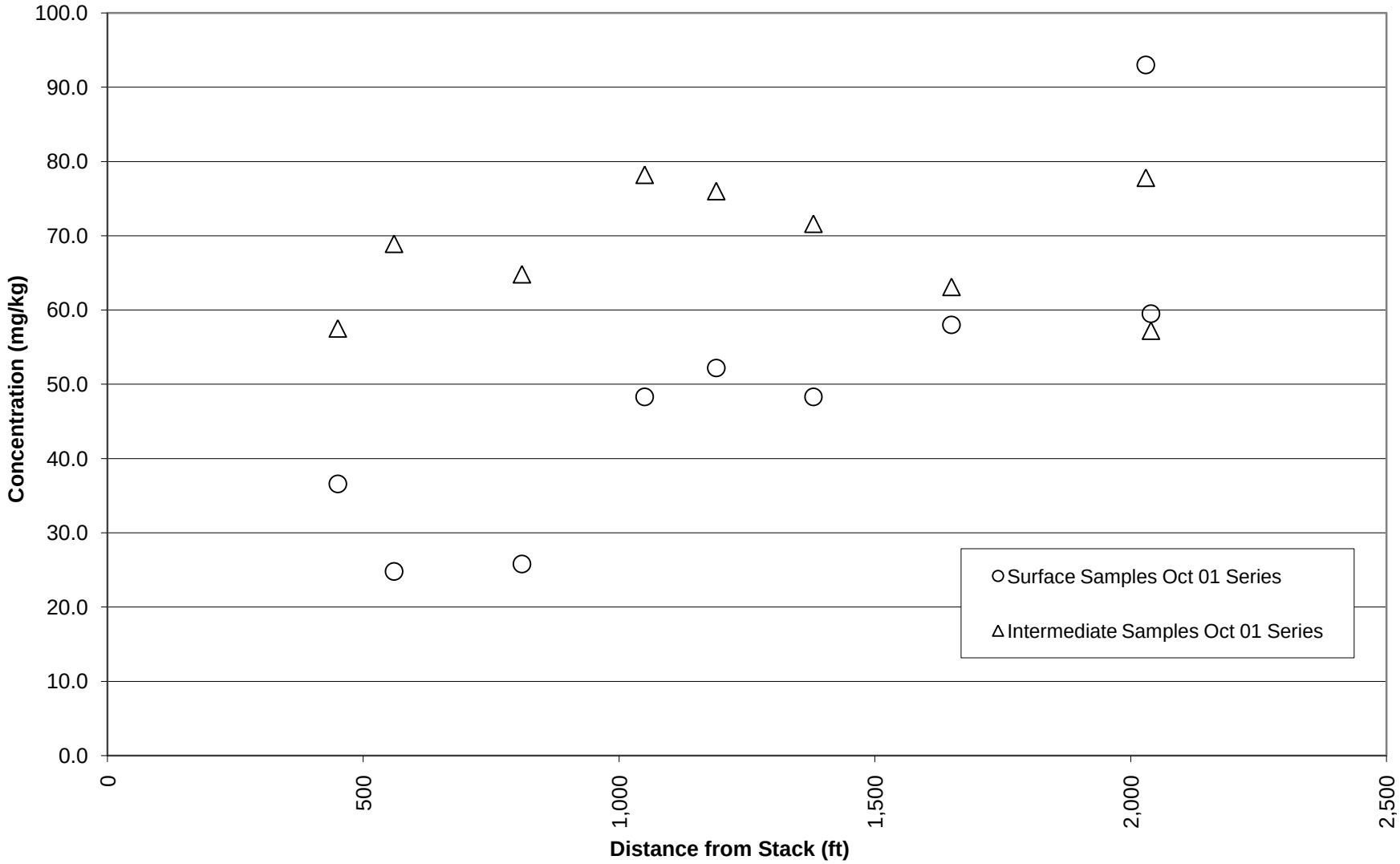


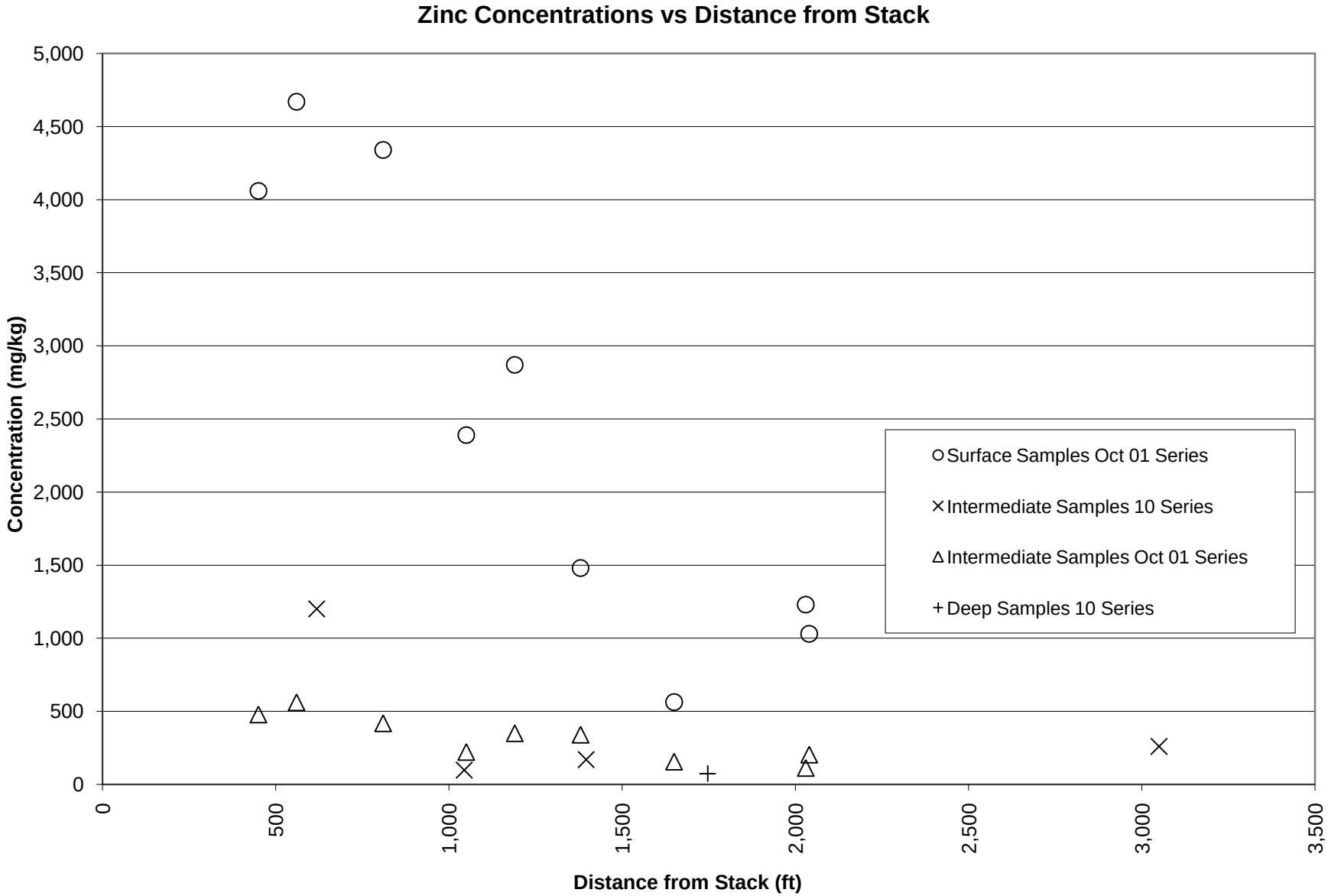

Strontium Concentrations vs Distance from Stack
Concentration (mg/kg)
160
140
120
100
80
60
40
20
0
0
500
1,000
1,500
2,000
2,500
Distance from Stack (ft)
Surface Samples Oct 01 Series
Intermediate Samples Oct 01 Series

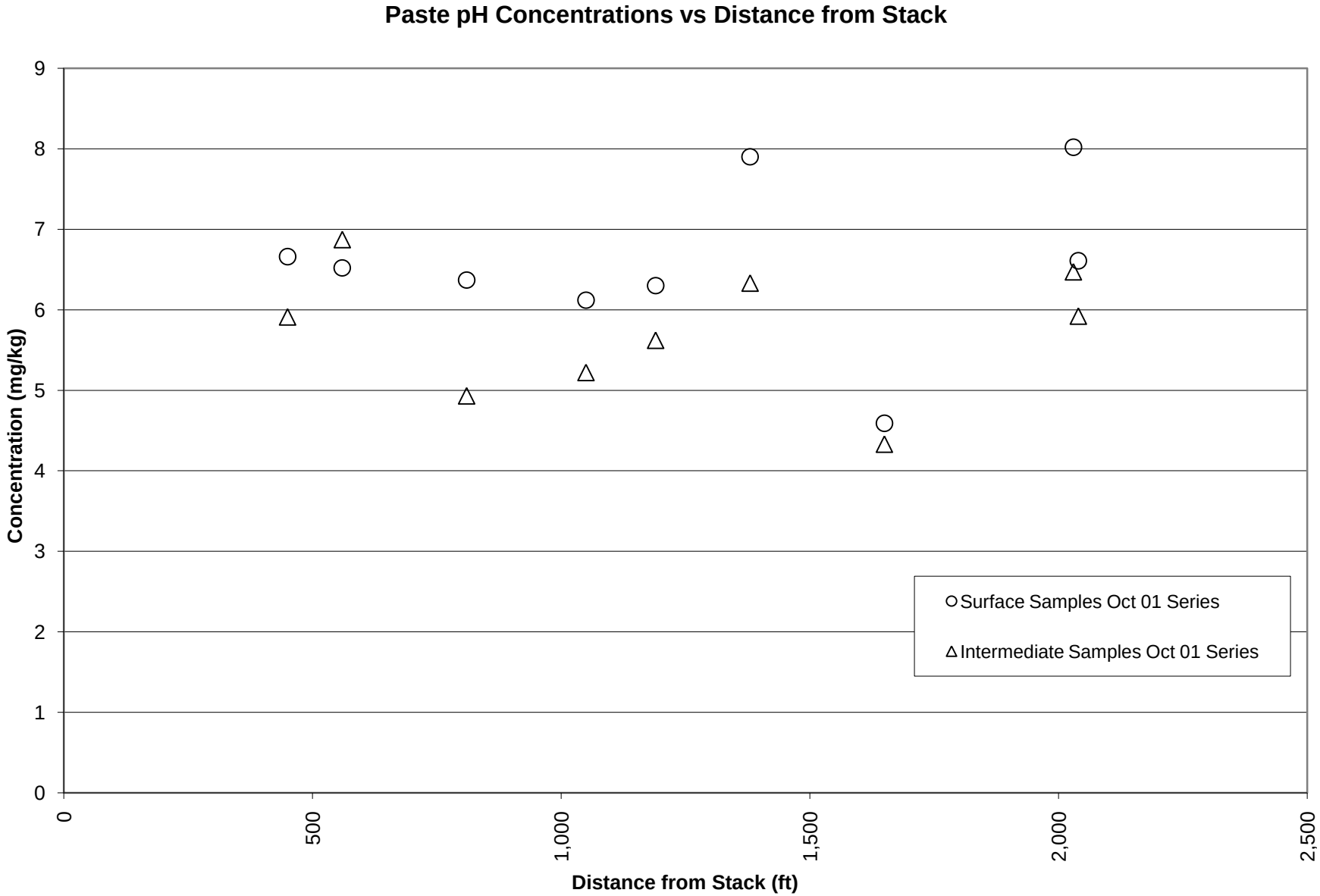

Thallium Concentrations vs Distance from Stack
Concentration (mg/kg)
120
100
80
60
40
20
0
0
500
1,000
1,500
2,000
2,500
3,000
3,500
Distance from Stack (ft)
Surface Samples Oct 01 Series
Intermediate Samples 10 Series
Intermediate Samples Oct 01 Series
Deep Samples 10 Series


Tin Concentrations vs Distance from Stack
Concentration (mg/kg)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0
500
1,000
1,500
2,000
2,500
Distance from Stack (ft)
Surface Samples Oct 01 Series
Intermediate Samples Oct 01 Series

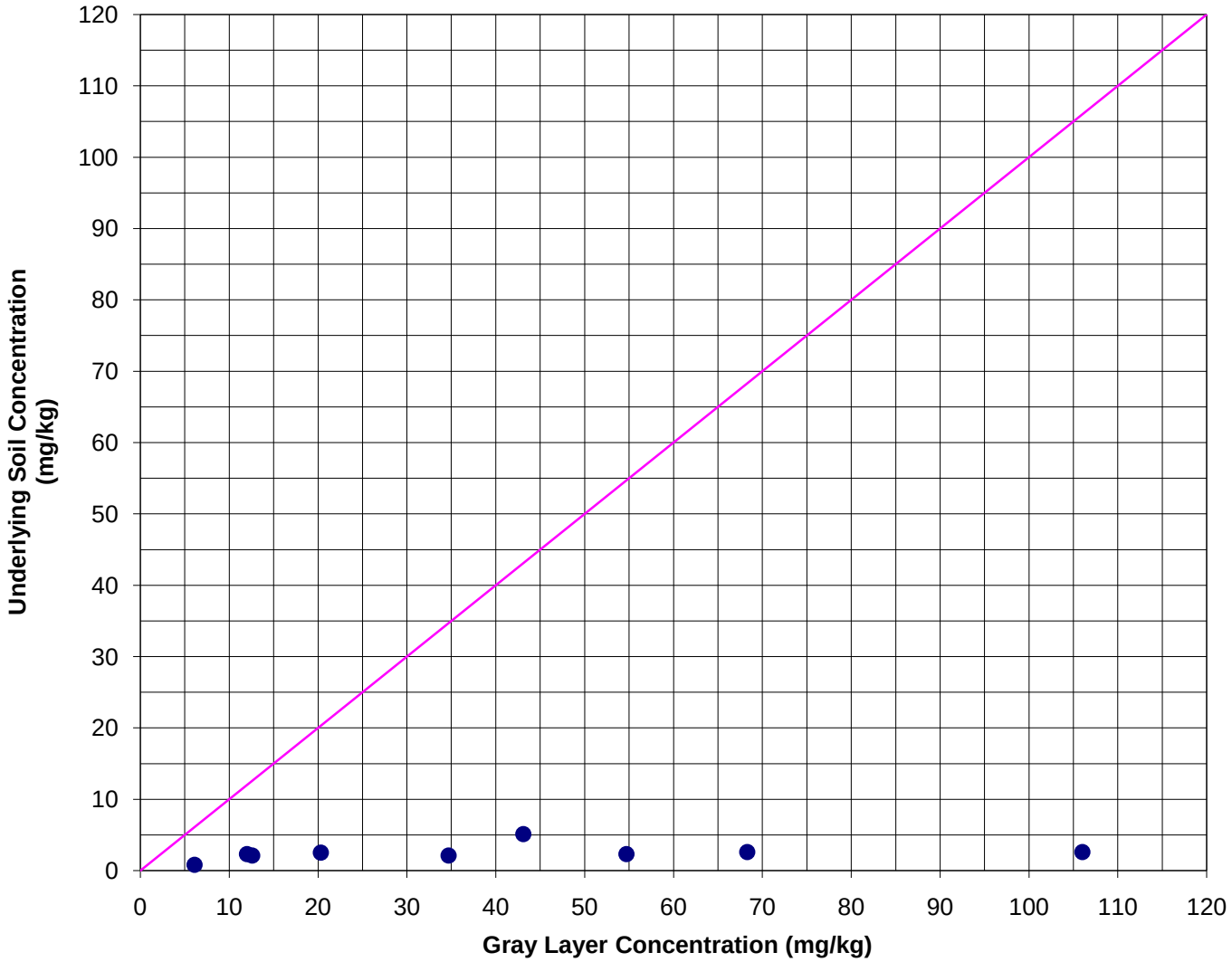
Vanadium Concentrations vs Distance from Stack




Zinc Concentrations vs Distance from Stack
Concentration (mg/kg)
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
500
1,000
1,500
2,000
2,500
3,000
3,500
Distance from Stack (ft)
Surface Samples Oct 01 Series
Intermediate Samples 10 Series
Intermediate Samples Oct 01 Series
Deep Samples 10 Series

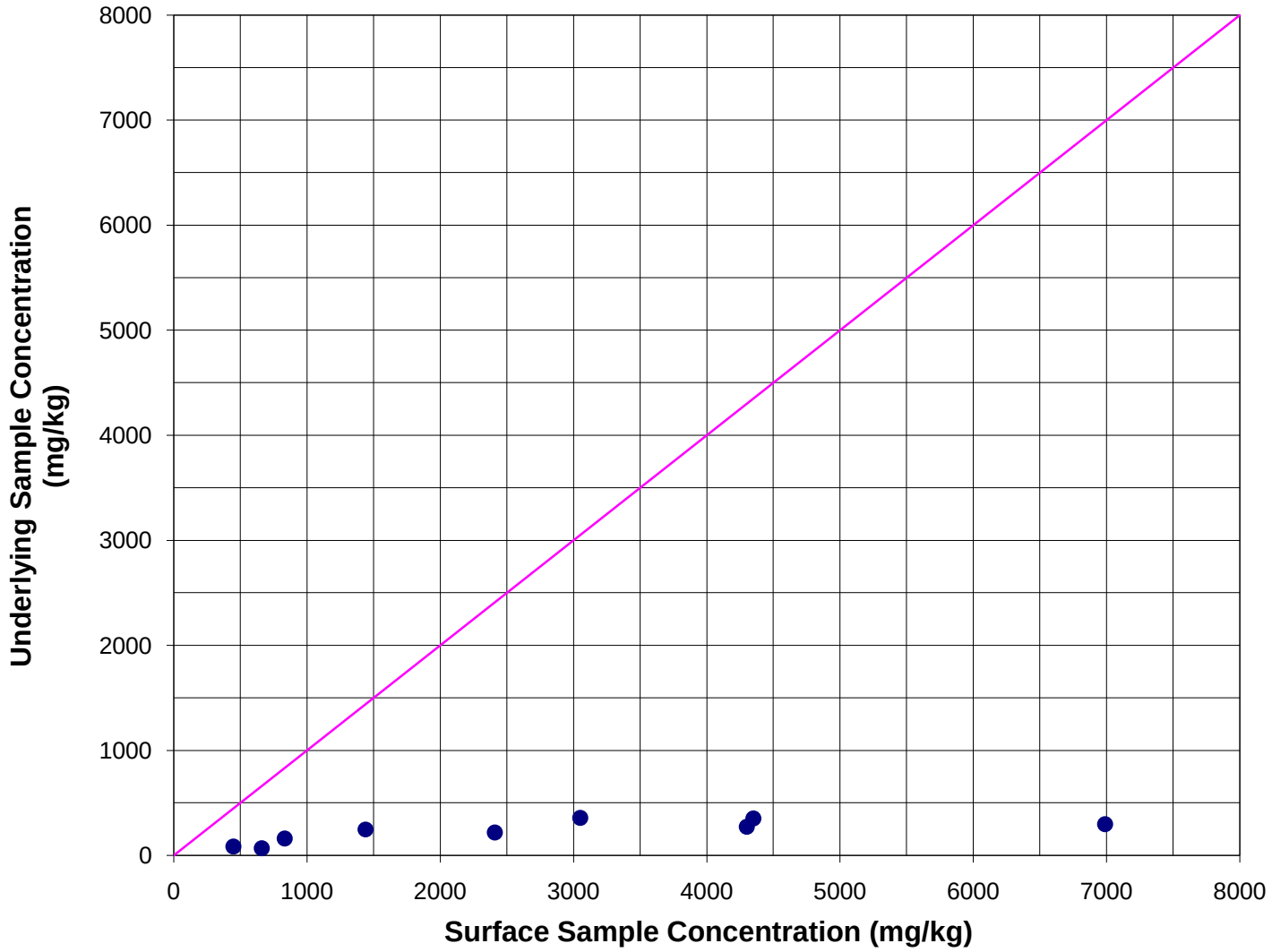

Paste pH Concentrations vs Distance from Stack
Concentration (mg/kg)
0
1
2
3
4
5
6
7
8
9
0
500
1,000
1,500
2,000
2,500
Distance from Stack (ft)
Surface Samples Oct 01 Series
Intermediate Samples Oct 01 Series

< 250 μm Sb Cross Plots



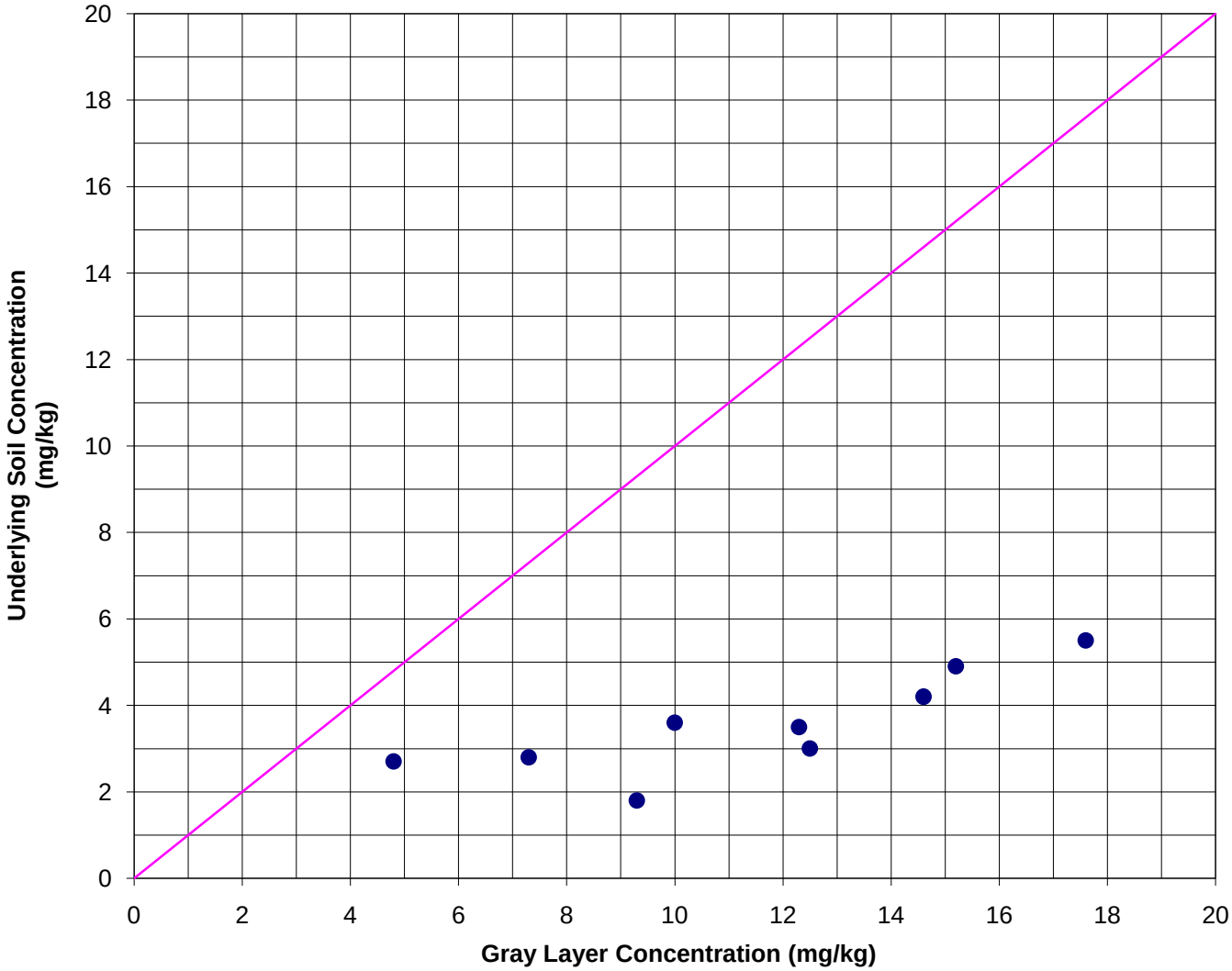
Golder Associates

< 250 um As Cross Plots

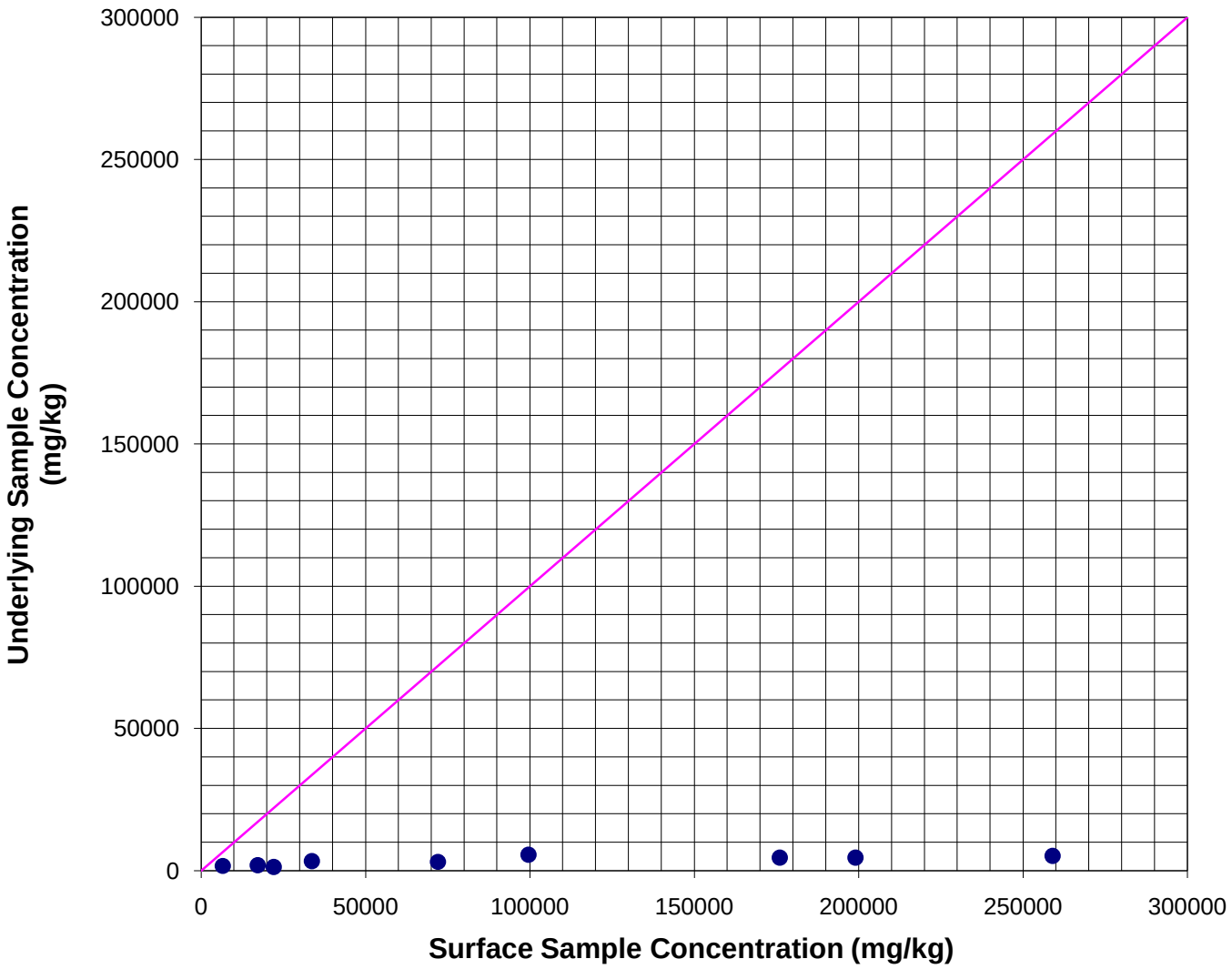


Golder Associates

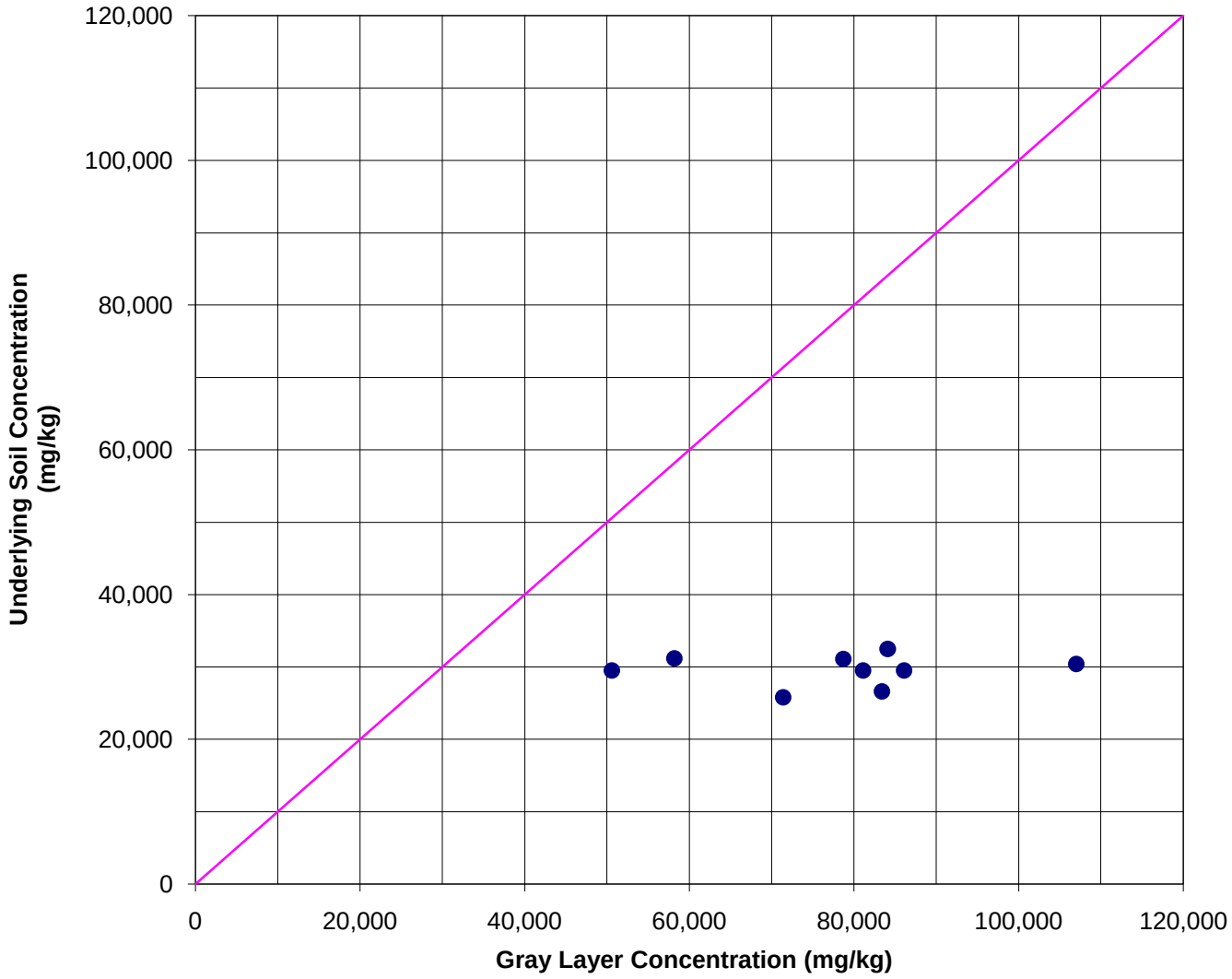
< 250 μm Cd Cross Plots



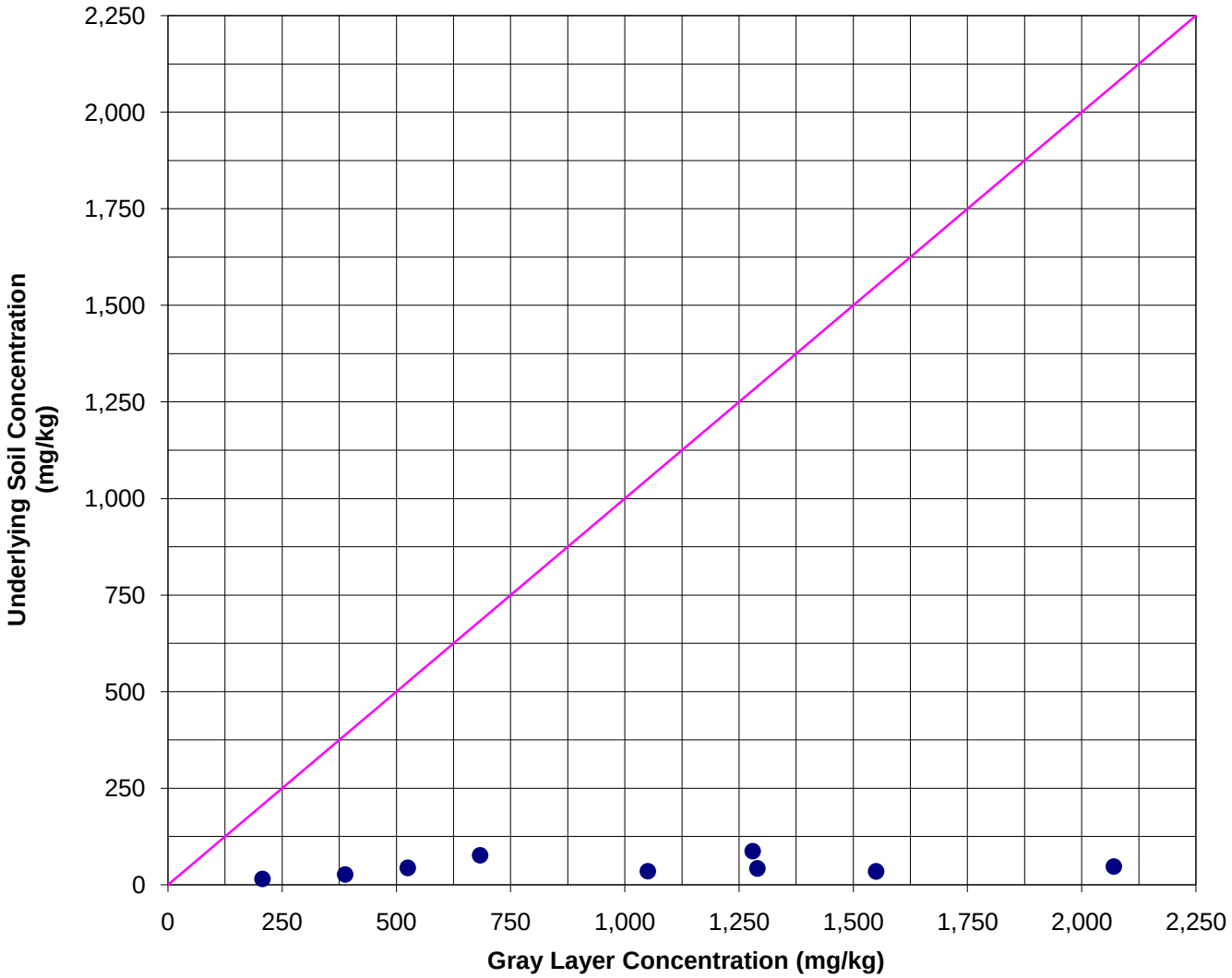
< 250 um Cu Cross Plots



< 250 μm Fe Cross Plots

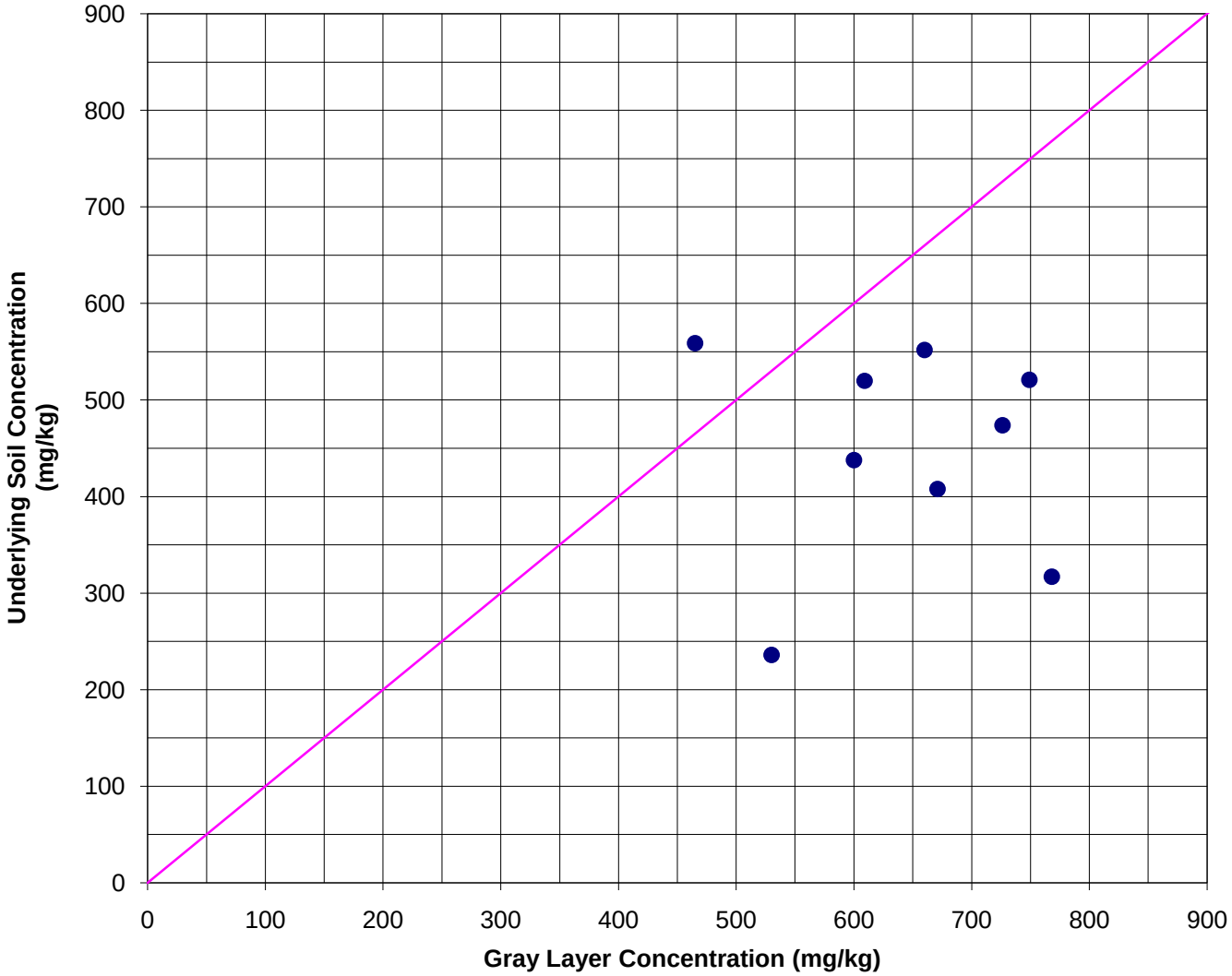


< 250 μm Pb Cross Plots

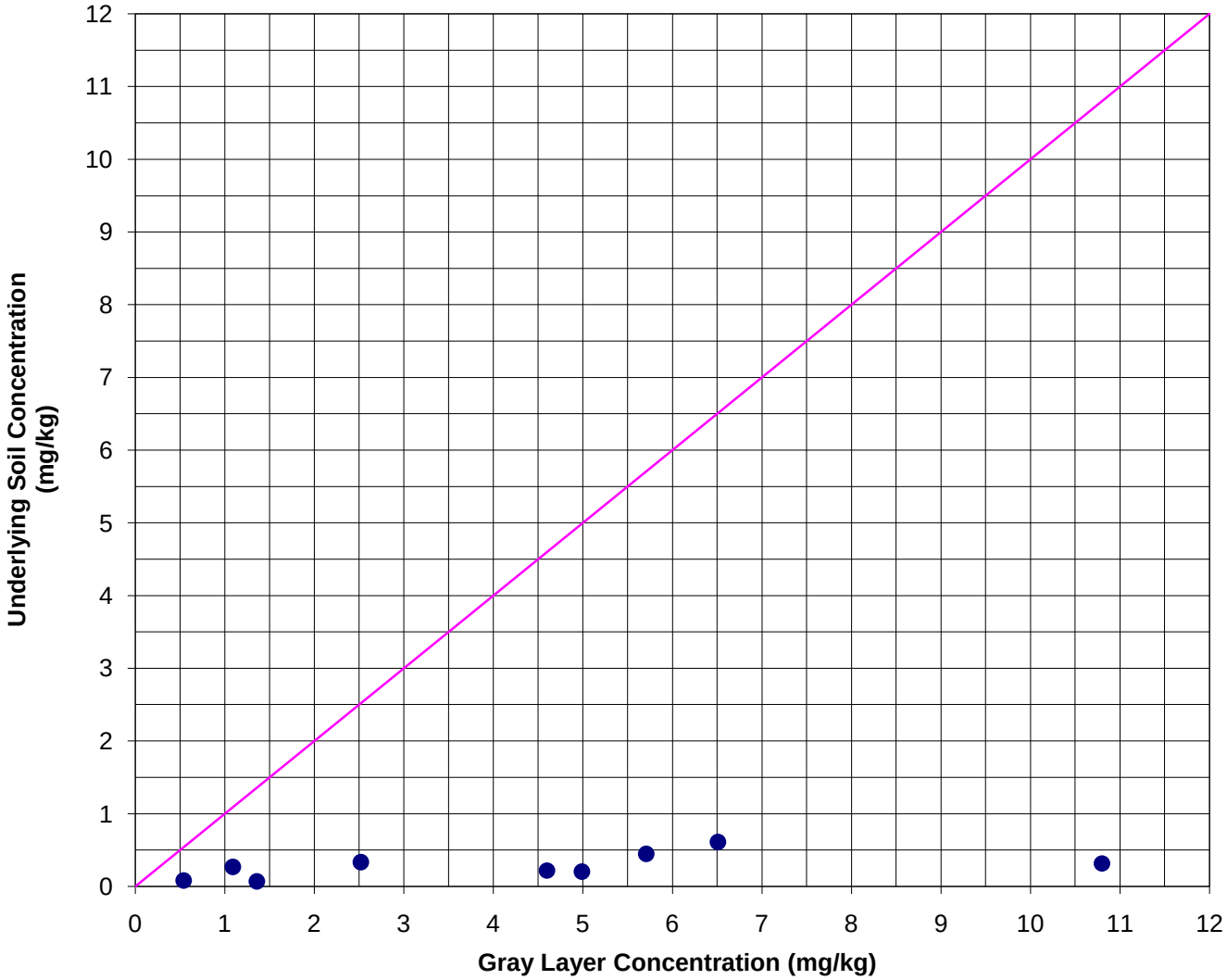


Golder Associates

< 250 μm Mn Cross Plots

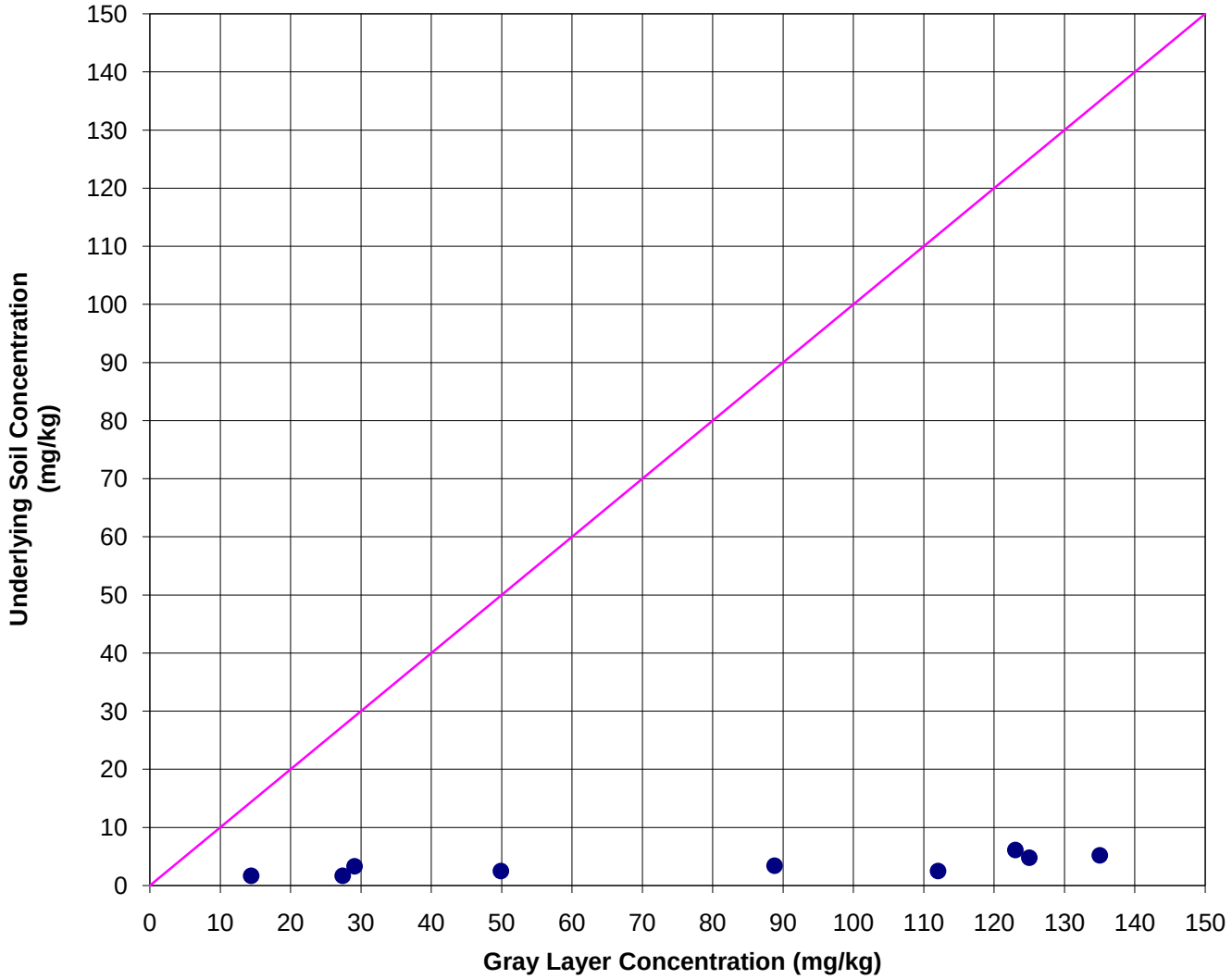


< 250 μm Hg Cross Plots

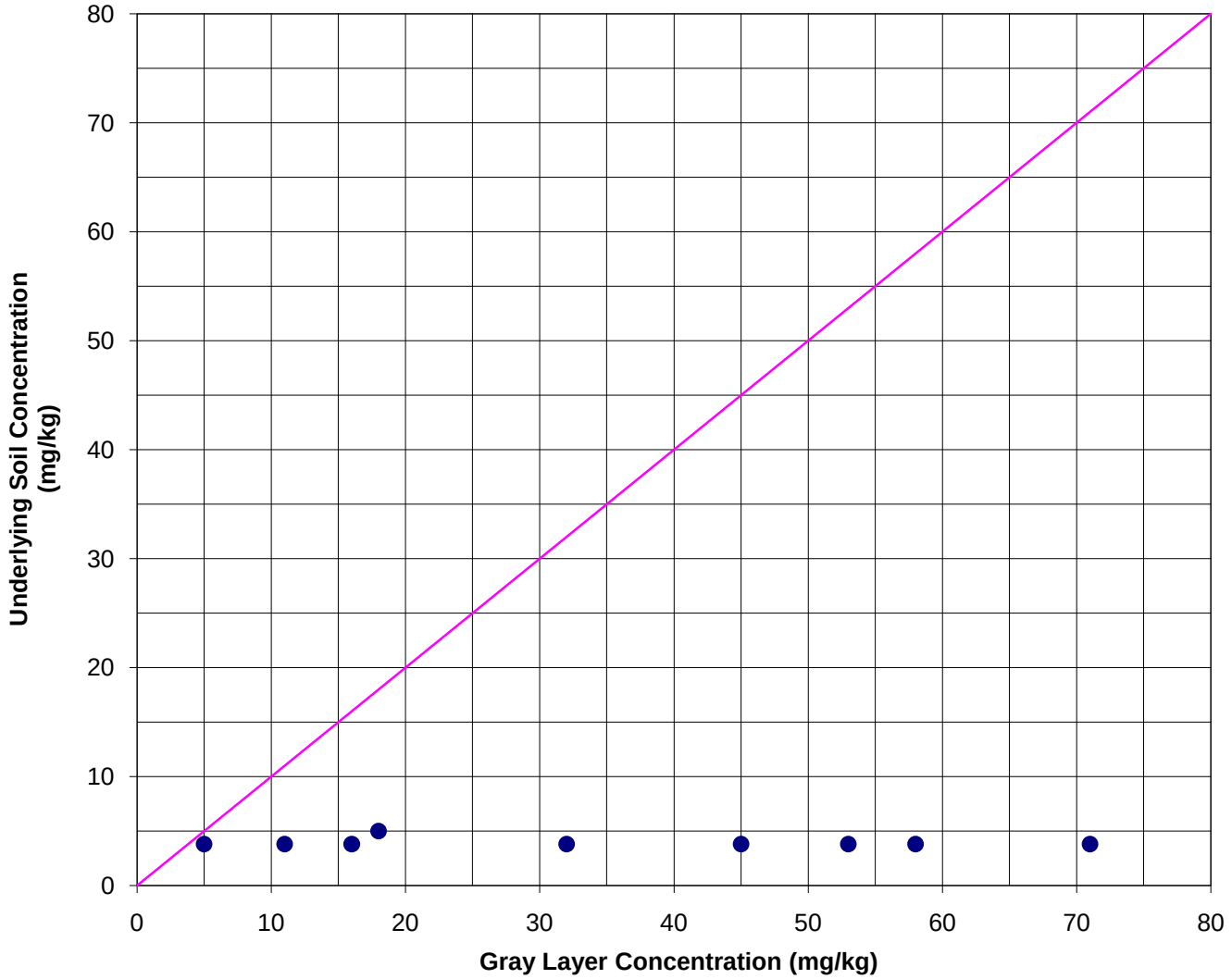


Golder Associates

< 250 μm Ag Cross Plots

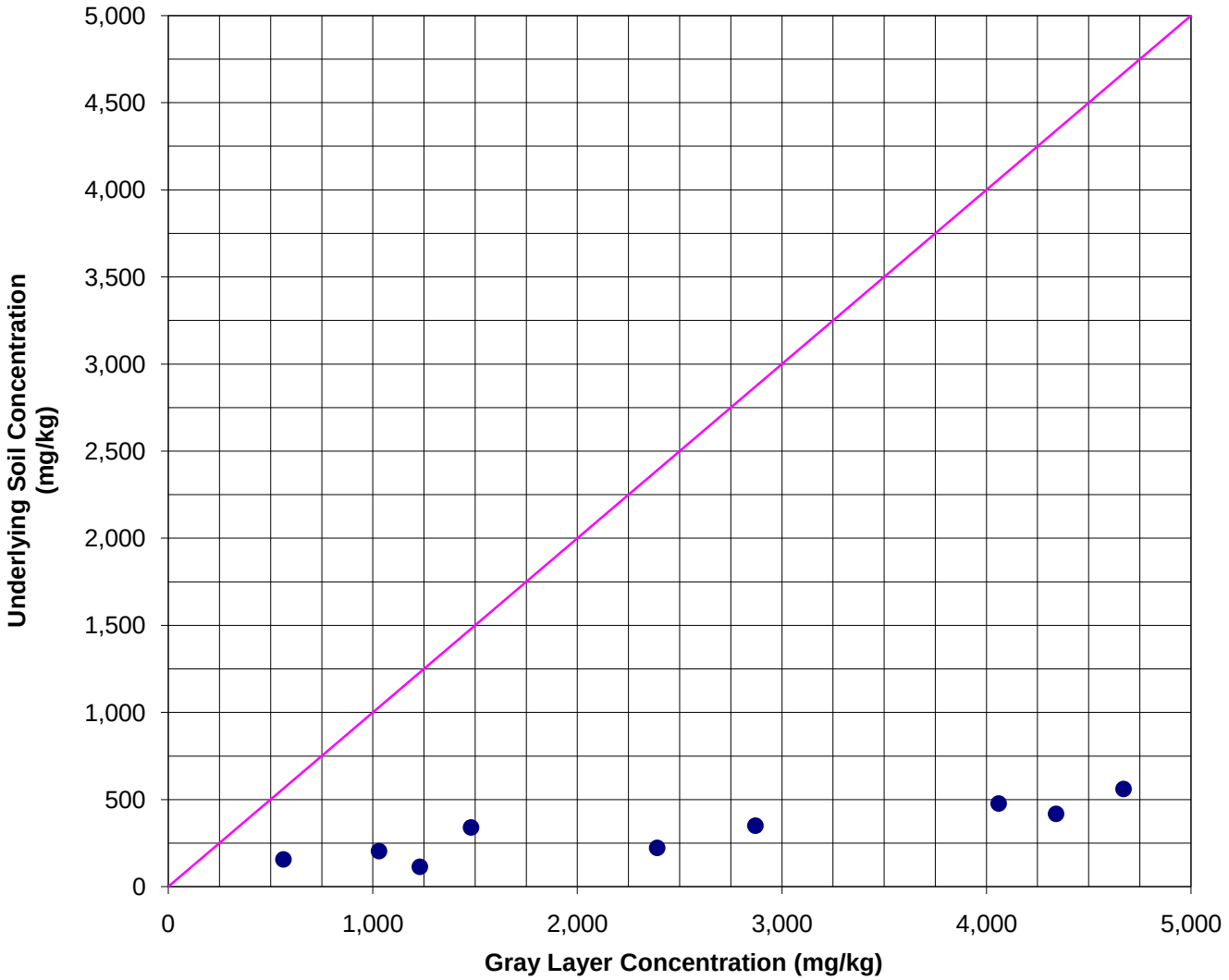


< 250 μm Sn Cross Plots



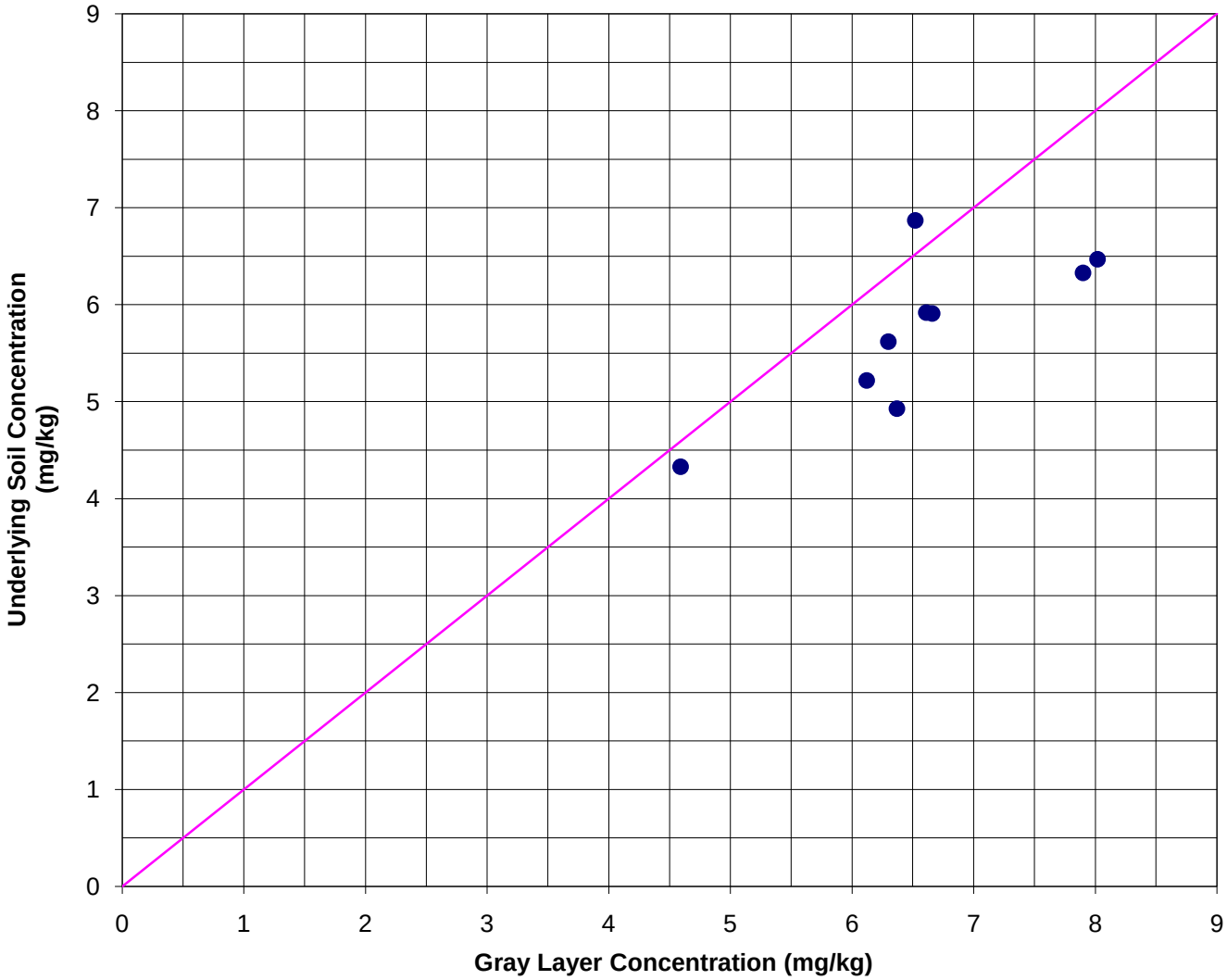
Golder Associates

< 250 μm Zn Cross Plots



Golder Associates

Paste pH Cross Plots



Golder Associates

Appendix A5
Arsenic and Copper Mineralogy

TABLE A5-1
ELECTRON MICROPROBE ANALYSIS RESULTS FOR SUPERIOR WEST PLANT SITE

Sample ID	Arsenic Concentration (mg/kg)	Copper Concentration (mg/kg)	Mineral ID	Common Name	Frequency of Occurrence (%)	Relative Copper Mass (%)	Relative Arsenic Mass (%)
GAI-1S	661	22100	AsMO	AsMO	8.78%	3.12%	86.64%
GAI-1S	661	22100	Cu	Native Copper	1.50%	8.83%	0.00%
GAI-1S	661	22100	Cu5FeS4	Bornite	8.74%	18.49%	0.00%
GAI-1S	661	22100	CuFeS2	Chalcopyrite	17.34%	16.61%	0.00%
GAI-1S	661	22100	CuFe2S3	Cubanite	14.27%	15.36%	0.00%
GAI-1S	661	22100	CuO	Tenorite	1.59%	5.03%	0.00%
GAI-1S	661	22100	CuSO4	Copper sulfate	3.76%	5.19%	0.00%
GAI-1S	661	22100	FeCuO	FeCuO	4.32%	2.96%	8.93%
GAI-1S	661	22100	CuMO	CuMO		0.00%	0.00%
GAI-1S	661	22100	Cu2FeS2	Cu2FeS2		0.00%	0.00%
GAI-1S	661	22100	Cu2S	Chalcocite	6.93%	20.78%	0.00%
GAI-1S	661	22100	Cu2Cl(OH)	Cu2Cl(OH)		0.00%	0.00%
GAI-1S	661	22100	CaCO3/Clay	CaCO3/Clay		0.00%	0.00%
GAI-1S	661	22100	FeOOH	Goethite	24.80%	2.49%	1.07%
GAI-1S	661	22100	Sulfosalt	Sulfosalt		0.00%	0.00%
GAI-1S	661	22100	FeSO4	FeSO4	7.72%	1.13%	3.36%
GAI-1S	661	22100	MnOOH	MnOOH	0.25%	0.01%	0.00%
GAI-1S	661	22100	Slag	Slag		0.00%	0.00%
GAI-1S	661	22100	Brass	Brass		0.00%	0.00%
GAI-1S	661	22100	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-2S	4350	199000	AsMO	AsMO	3.33%	0.61%	87.41%
GAI-2S	4350	199000	Cu	Native Copper	4.22%	12.77%	0.00%
GAI-2S	4350	199000	Cu5FeS4	Bornite	11.94%	13.03%	0.00%
GAI-2S	4350	199000	CuFeS2	Chalcopyrite	16.25%	8.03%	0.00%
GAI-2S	4350	199000	CuFe2S3	Cubanite	9.25%	5.13%	0.00%
GAI-2S	4350	199000	CuO	Tenorite	7.44%	12.11%	0.00%
GAI-2S	4350	199000	CuSO4	Copper sulfate	1.33%	0.95%	0.00%
GAI-2S	4350	199000	FeCuO	FeCuO	1.43%	0.51%	7.87%
GAI-2S	4350	199000	CuMO	CuMO	0.00%	0.00%	0.00%
GAI-2S	4350	199000	Cu2FeS2	Cu2FeS2	3.61%	2.43%	0.00%
GAI-2S	4350	199000	Cu2S	Chalcocite	28.24%	43.68%	0.00%
GAI-2S	4350	199000	Cu2Cl(OH)	Cu2Cl(OH)	0.00%	0.00%	0.00%
GAI-2S	4350	199000	CaCO3/Clay	CaCO3/Clay	0.00%	0.00%	0.00%
GAI-2S	4350	199000	FeOOH	Goethite	9.86%	0.51%	1.13%
GAI-2S	4350	199000	Sulfosalt	Sulfosalt	0.00%	0.00%	0.00%
GAI-2S	4350	199000	FeSO4	FeSO4	3.10%	0.23%	3.59%
GAI-2S	4350	199000	MnOOH	MnOOH	0.00%	0.00%	0.00%
GAI-2S	4350	199000	Slag	Slag	0.00%	0.00%	0.00%
GAI-2S	4350	199000	Brass	Brass	0.00%	0.00%	0.00%
GAI-2S	4350	199000	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-3S	6990	259000	AsMO	AsMO	2.23%	0.45%	69.03%
GAI-3S	6990	259000	Cu	Native Copper	3.38%	11.21%	0.00%
GAI-3S	6990	259000	Cu5FeS4	Bornite	4.07%	4.87%	0.00%
GAI-3S	6990	259000	CuFeS2	Chalcopyrite	16.39%	8.87%	0.00%
GAI-3S	6990	259000	CuFe2S3	Cubanite	8.05%	4.90%	0.00%
GAI-3S	6990	259000	CuO	Tenorite	5.41%	9.65%	0.00%
GAI-3S	6990	259000	CuSO4	Copper sulfate	1.37%	1.07%	0.00%
GAI-3S	6990	259000	FeCuO	FeCuO	0.70%	0.27%	4.54%
GAI-3S	6990	259000	CuMO	CuMO		0.00%	0.00%
GAI-3S	6990	259000	Cu2FeS2	Cu2FeS2	7.82%	5.76%	0.00%
GAI-3S	6990	259000	Cu2S	Chalcocite	29.84%	50.56%	0.00%
GAI-3S	6990	259000	Cu2Cl(OH)	Cu2Cl(OH)		0.00%	0.00%
GAI-3S	6990	259000	CaCO3/Clay	CaCO3/Clay	1.01%	0.03%	0.00%
GAI-3S	6990	259000	FeOOH	Goethite	14.40%	0.82%	1.95%
GAI-3S	6990	259000	Sulfosalt	Sulfosalt	1.55%	1.23%	19.31%
GAI-3S	6990	259000	FeSO4	FeSO4	3.78%	0.31%	5.15%
GAI-3S	6990	259000	MnOOH	MnOOH		0.00%	0.00%

TABLE A5-1
ELECTRON MICROPROBE ANALYSIS RESULTS FOR SUPERIOR WEST PLANT SITE

Sample ID	Arsenic Concentration (mg/kg)	Copper Concentration (mg/kg)	Mineral ID	Common Name	Frequency of Occurrence (%)	Relative Copper Mass (%)	Relative Arsenic Mass (%)
GAI-3S	6990	259000	Slag	Slag		0.00%	0.00%
GAI-3S	6990	259000	Brass	Brass		0.00%	0.00%
GAI-3S	6990	259000	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-4S	4300	176000	AsMO	AsMO	1.37%	0.25%	70.69%
GAI-4S	4300	176000	Cu	Native Copper	3.55%	10.72%	0.00%
GAI-4S	4300	176000	Cu5FeS4	Bornite	8.25%	8.97%	0.00%
GAI-4S	4300	176000	CuFeS2	Chalcopyrite	17.09%	8.41%	0.00%
GAI-4S	4300	176000	CuFe2S3	Cubanite	7.55%	4.17%	0.00%
GAI-4S	4300	176000	CuO	Tenorite	5.79%	9.39%	0.00%
GAI-4S	4300	176000	CuSO4	Copper sulfate	1.54%	1.09%	0.00%
GAI-4S	4300	176000	FeCuO	FeCuO	1.57%	0.55%	17.03%
GAI-4S	4300	176000	CuMO	CuMO	0.00%	0.00%	0.00%
GAI-4S	4300	176000	Cu2FeS2	Cu2FeS2	5.58%	3.74%	0.00%
GAI-4S	4300	176000	Cu2S	Chalcocite	33.63%	51.82%	0.00%
GAI-4S	4300	176000	Cu2Cl(OH)	Cu2Cl(OH)	0.00%	0.00%	0.00%
GAI-4S	4300	176000	CaCO3/Clay	CaCO3/Clay	0.00%	0.00%	0.00%
GAI-4S	4300	176000	FeOOH	Goethite	10.94%	0.56%	2.48%
GAI-4S	4300	176000	Sulfosalt	Sulfosalt	0.14%	0.10%	2.93%
GAI-4S	4300	176000	FeSO4	FeSO4	3.01%	0.23%	6.87%
GAI-4S	4300	176000	MnOOH	MnOOH	0.00%	0.00%	0.00%
GAI-4S	4300	176000	Slag	Slag	0.00%	0.00%	0.00%
GAI-4S	4300	176000	Brass	Brass	0.00%	0.00%	0.00%
GAI-4S	4300	176000	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-5S	448	6590	AsMO	AsMO	5.44%	2.15%	86.43%
GAI-5S	448	6590	Cu	Native Copper	0.00%	0.00%	0.00%
GAI-5S	448	6590	Cu5FeS4	Bornite	3.38%	7.95%	0.00%
GAI-5S	448	6590	CuFeS2	Chalcopyrite	16.58%	17.67%	0.00%
GAI-5S	448	6590	CuFe2S3	Cubanite	6.87%	8.23%	0.00%
GAI-5S	448	6590	CuO	Tenorite	3.29%	11.56%	0.00%
GAI-5S	448	6590	CuSO4	Copper sulfate	1.20%	1.85%	0.00%
GAI-5S	448	6590	FeCuO	FeCuO	1.72%	1.31%	5.72%
GAI-5S	448	6590	CuMO	CuMO		0.00%	0.00%
GAI-5S	448	6590	Cu2FeS2	Cu2FeS2	4.49%	6.52%	0.00%
GAI-5S	448	6590	Cu2S	Chalcocite	11.17%	37.26%	0.00%
GAI-5S	448	6590	Cu2Cl(OH)	Cu2Cl(OH)	0.00%	0.00%	0.00%
GAI-5S	448	6590	CaCO3/Clay	CaCO3/Clay		0.00%	0.00%
GAI-5S	448	6590	FeOOH	Goethite	38.48%	4.29%	2.68%
GAI-5S	448	6590	Sulfosalt	Sulfosalt	0.00%	0.00%	0.00%
GAI-5S	448	6590	FeSO4	FeSO4	7.39%	1.20%	5.17%
GAI-5S	448	6590	MnOOH	MnOOH		0.00%	0.00%
GAI-5S	448	6590	Slag	Slag		0.00%	0.00%
GAI-5S	448	6590	Brass	Brass		0.00%	0.00%
GAI-5S	448	6590	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-6S	2410	72000	AsMO	AsMO	3.68%	0.86%	83.90%
GAI-6S	2410	72000	Cu	Native Copper	2.35%	9.09%	0.00%
GAI-6S	2410	72000	Cu5FeS4	Bornite	9.95%	13.89%	0.00%
GAI-6S	2410	72000	CuFeS2	Chalcopyrite	16.51%	10.44%	0.00%
GAI-6S	2410	72000	CuFe2S3	Cubanite	7.86%	5.58%	0.00%
GAI-6S	2410	72000	CuO	Tenorite	6.71%	13.98%	0.00%
GAI-6S	2410	72000	CuSO4	Copper sulfate	2.81%	2.56%	0.00%
GAI-6S	2410	72000	FeCuO	FeCuO	2.19%	0.99%	10.46%
GAI-6S	2410	72000	CuMO	CuMO	0.00%	0.00%	0.00%
GAI-6S	2410	72000	Cu2FeS2	Cu2FeS2	6.61%	5.69%	0.00%
GAI-6S	2410	72000	Cu2S	Chalcocite	17.88%	35.40%	0.00%
GAI-6S	2410	72000	Cu2Cl(OH)	Cu2Cl(OH)	0.00%	0.00%	0.00%
GAI-6S	2410	72000	CaCO3/Clay	CaCO3/Clay	0.00%	0.00%	0.00%
GAI-6S	2410	72000	FeOOH	Goethite	17.17%	1.14%	1.72%

TABLE A5-1
ELECTRON MICROPROBE ANALYSIS RESULTS FOR SUPERIOR WEST PLANT SITE

Sample ID	Arsenic Concentration (mg/kg)	Copper Concentration (mg/kg)	Mineral ID	Common Name	Frequency of Occurrence (%)	Relative Copper Mass (%)	Relative Arsenic Mass (%)
GAI-6S	2410	72000	Sulfosalt	Sulfosalt	0.00%	0.00%	0.00%
GAI-6S	2410	72000	FeSO4	FeSO4	3.89%	0.38%	3.91%
GAI-6S	2410	72000	MnOOH	MnOOH	0.00%	0.00%	0.00%
GAI-6S	2410	72000	Slag	Slag	2.40%	0.01%	0.01%
GAI-6S	2410	72000	Brass	Brass	0.00%	0.00%	0.00%
GAI-6S	2410	72000	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-7S	3050	99600	AsMO	AsMO	6.23%	1.31%	91.00%
GAI-7S	3050	99600	Cu	Native Copper	2.47%	8.52%	0.00%
GAI-7S	3050	99600	Cu5FeS4	Bornite	8.71%	10.85%	0.00%
GAI-7S	3050	99600	CuFeS2	Chalcopyrite	14.40%	8.12%	0.00%
GAI-7S	3050	99600	CuFe2S3	Cubanite	5.54%	3.51%	0.00%
GAI-7S	3050	99600	CuO	Tenorite	8.63%	16.03%	0.00%
GAI-7S	3050	99600	CuSO4	Copper sulfate	4.74%	3.85%	0.00%
GAI-7S	3050	99600	FeCuO	FeCuO	1.25%	0.50%	3.82%
GAI-7S	3050	99600	CuMO	CuMO	0.00%	0.00%	0.00%
GAI-7S	3050	99600	Cu2FeS2	Cu2FeS2	3.38%	2.59%	0.00%
GAI-7S	3050	99600	Cu2S	Chalcocite	24.57%	43.36%	0.00%
GAI-7S	3050	99600	Cu2Cl(OH)	Cu2Cl(OH)	0.00%	0.00%	0.00%
GAI-7S	3050	99600	CaCO3/Clay	CaCO3/Clay	0.00%	0.00%	0.00%
GAI-7S	3050	99600	FeOOH	Goethite	13.35%	0.79%	0.85%
GAI-7S	3050	99600	Sulfosalt	Sulfosalt	0.00%	0.00%	0.00%
GAI-7S	3050	99600	FeSO4	FeSO4	6.73%	0.58%	4.33%
GAI-7S	3050	99600	MnOOH	MnOOH	0.00%	0.00%	0.00%
GAI-7S	3050	99600	Slag	Slag	0.00%	0.00%	0.00%
GAI-7S	3050	99600	Brass	Brass	0.00%	0.00%	0.00%
GAI-7S	3050	99600	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-8S	246	3390	AsMO	AsMO	13.26%	4.36%	92.68%
GAI-8S	246	3390	Cu	Native Copper	4.75%	25.74%	0.00%
GAI-8S	246	3390	Cu5FeS4	Bornite	2.43%	4.75%	0.00%
GAI-8S	246	3390	CuFeS2	Chalcopyrite	15.64%	13.83%	0.00%
GAI-8S	246	3390	CuFe2S3	Cubanite	16.45%	16.33%	0.00%
GAI-8S	246	3390	CuO	Tenorite	0.62%	1.81%	0.00%
GAI-8S	246	3390	CuSO4	Copper sulfate	0.89%	1.14%	0.00%
GAI-8S	246	3390	FeCuO	FeCuO	1.65%	1.04%	2.41%
GAI-8S	246	3390	CuMO	CuMO		0.00%	0.00%
GAI-8S	246	3390	Cu2FeS2	Cu2FeS2	10.13%	12.19%	0.00%
GAI-8S	246	3390	Cu2S	Chalcocite	5.35%	14.80%	0.00%
GAI-8S	246	3390	Cu2Cl(OH)	Cu2Cl(OH)	0.00%	0.00%	0.00%
GAI-8S	246	3390	CaCO3/Clay	CaCO3/Clay	0.00%	0.00%	0.00%
GAI-8S	246	3390	FeOOH	Goethite	22.87%	2.12%	0.70%
GAI-8S	246	3390	Sulfosalt	Sulfosalt	0.95%	1.23%	2.66%
GAI-8S	246	3390	FeSO4	FeSO4	5.02%	0.68%	1.55%
GAI-8S	246	3390	MnOOH	MnOOH	0.00%	0.00%	0.00%
GAI-8S	246	3390	Slag	Slag	0.00%	0.00%	0.00%
GAI-8S	246	3390	Brass	Brass		0.00%	0.00%
GAI-8S	246	3390	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-9S	834	17200	AsMO	AsMO	2.50%	0.95%	62.06%
GAI-9S	834	17200	Cu	Native Copper	0.72%	4.51%	0.00%
GAI-9S	834	17200	Cu5FeS4	Bornite	11.91%	26.83%	0.00%
GAI-9S	834	17200	CuFeS2	Chalcopyrite	24.60%	25.10%	0.00%
GAI-9S	834	17200	CuFe2S3	Cubanite	9.97%	11.42%	0.00%
GAI-9S	834	17200	CuO	Tenorite	0.36%	1.21%	0.00%
GAI-9S	834	17200	CuSO4	Copper sulfate	3.38%	4.97%	0.00%
GAI-9S	834	17200	FeCuO	FeCuO	4.89%	3.57%	25.42%
GAI-9S	834	17200	CuMO	CuMO		0.00%	0.00%
GAI-9S	834	17200	Cu2FeS2	Cu2FeS2	8.03%	11.15%	0.00%
GAI-9S	834	17200	Cu2S	Chalcocite	1.80%	5.76%	0.00%

TABLE A5-1
ELECTRON MICROPROBE ANALYSIS RESULTS FOR SUPERIOR WEST PLANT SITE

Sample ID	Arsenic Concentration (mg/kg)	Copper Concentration (mg/kg)	Mineral ID	Common Name	Frequency of Occurrence (%)	Relative Copper Mass (%)	Relative Arsenic Mass (%)
GAI-9S	834	17200	Cu2Cl(OH)	Cu2Cl(OH)	0.00%	0.00%	0.00%
GAI-9S	834	17200	CaCO3/Clay	CaCO3/Clay	0.00%	0.00%	0.00%
GAI-9S	834	17200	FeOOH	Goethite	29.36%	3.13%	3.19%
GAI-9S	834	17200	Sulfosalt	Sulfosalt	0.74%	1.12%	7.43%
GAI-9S	834	17200	FeSO4	FeSO4	1.74%	0.27%	1.90%
GAI-9S	834	17200	MnOOH	MnOOH	0.00%	0.00%	0.00%
GAI-9S	834	17200	Slag	Slag	0.00%	0.00%	0.00%
GAI-9S	834	17200	Brass	Brass		0.00%	0.00%
GAI-9S	834	17200	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-11S	4190	98300	AsMO	AsMO	5.19%	1.21%	85.51%
GAI-11S	4190	98300	Cu	Native Copper	0.75%	2.89%	0.00%
GAI-11S	4190	98300	Cu5FeS4	Bornite	7.55%	10.48%	0.00%
GAI-11S	4190	98300	CuFeS2	Chalcopyrite	9.45%	5.94%	0.00%
GAI-11S	4190	98300	CuFe2S3	Cubanite	11.57%	8.17%	0.00%
GAI-11S	4190	98300	CuO	Tenorite	7.47%	15.47%	0.00%
GAI-11S	4190	98300	CuSO4	Copper sulfate	2.83%	2.56%	0.00%
GAI-11S	4190	98300	FeCuO	FeCuO	1.82%	0.82%	6.27%
GAI-11S	4190	98300	CuMO	CuMO	0.22%	0.33%	0.00%
GAI-11S	4190	98300	Cu2FeS2	Cu2FeS2	2.54%	2.17%	0.00%
GAI-11S	4190	98300	Cu2S	Chalcocite	24.25%	47.71%	0.00%
GAI-11S	4190	98300	Cu2Cl(OH)	Cu2Cl(OH)		0.00%	0.00%
GAI-11S	4190	98300	CaCO3/Clay	CaCO3/Clay	0.00%	0.00%	0.00%
GAI-11S	4190	98300	FeOOH	Goethite	20.32%	1.34%	1.47%
GAI-11S	4190	98300	Sulfosalt	Sulfosalt	0.40%	0.37%	2.65%
GAI-11S	4190	98300	FeSO4	FeSO4	5.65%	0.54%	4.10%
GAI-11S	4190	98300	MnOOH	MnOOH		0.00%	0.00%
GAI-11S	4190	98300	Slag	Slag		0.00%	0.00%
GAI-11S	4190	98300	Brass	Brass		0.00%	0.00%
GAI-11S	4190	98300	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-1D	66.7	1280	AsMO	AsMO	17.06%	6.48%	94.60%
GAI-1D	66.7	1280	Cu	Native Copper	1.09%	6.85%	0.00%
GAI-1D	66.7	1280	Cu5FeS4	Bornite	11.31%	25.54%	0.00%
GAI-1D	66.7	1280	CuFeS2	Chalcopyrite	7.39%	7.55%	0.00%
GAI-1D	66.7	1280	CuFe2S3	Cubanite	5.84%	6.70%	0.00%
GAI-1D	66.7	1280	CuO	Tenorite	2.55%	8.60%	0.00%
GAI-1D	66.7	1280	CuSO4	Copper sulfate	5.47%	8.06%	0.00%
GAI-1D	66.7	1280	FeCuO	FeCuO	1.82%	1.33%	2.12%
GAI-1D	66.7	1280	CuMO	CuMO		0.00%	0.00%
GAI-1D	66.7	1280	Cu2FeS2	Cu2FeS2	2.74%	3.81%	0.00%
GAI-1D	66.7	1280	Cu2S	Chalcocite	2.83%	9.05%	0.00%
GAI-1D	66.7	1280	Cu2Cl(OH)	Cu2Cl(OH)	0.00%	0.00%	0.00%
GAI-1D	66.7	1280	CaCO3/Clay	CaCO3/Clay	0.00%	0.00%	0.00%
GAI-1D	66.7	1280	FeOOH	Goethite	24.18%	2.58%	0.59%
GAI-1D	66.7	1280	Sulfosalt	Sulfosalt	0.00%	0.00%	0.00%
GAI-1D	66.7	1280	FeSO4	FeSO4	10.86%	1.70%	2.65%
GAI-1D	66.7	1280	MnOOH	MnOOH	0.00%	0.00%	0.00%
GAI-1D	66.7	1280	Slag	Slag	0.00%	0.00%	0.00%
GAI-1D	66.7	1280	Brass	Brass	4.56%	11.74%	0.04%
GAI-1D	66.7	1280	**TOTAL**		**97.72%**	**100.00%**	**100.00%**
GAI-2D	351	4630	AsMO	AsMO	5.33%	1.29%	88.15%
GAI-2D	351	4630	Cu	Native Copper	1.30%	5.20%	0.00%
GAI-2D	351	4630	Cu5FeS4	Bornite	9.37%	13.49%	0.00%
GAI-2D	351	4630	CuFeS2	Chalcopyrite	12.46%	8.12%	0.00%
GAI-2D	351	4630	CuFe2S3	Cubanite	9.68%	7.09%	0.00%
GAI-2D	351	4630	CuO	Tenorite	3.74%	8.03%	0.00%
GAI-2D	351	4630	CuSO4	Copper sulfate	0.39%	0.37%	0.00%
GAI-2D	351	4630	FeCuO	FeCuO	2.61%	1.22%	9.03%

TABLE A5-1
ELECTRON MICROPROBE ANALYSIS RESULTS FOR SUPERIOR WEST PLANT SITE

Sample ID	Arsenic Concentration (mg/kg)	Copper Concentration (mg/kg)	Mineral ID	Common Name	Frequency of Occurrence (%)	Relative Copper Mass (%)	Relative Arsenic Mass (%)
GAI-2D	351	4630	CuMO	CuMO	0.26%	0.41%	0.00%
GAI-2D	351	4630	Cu2FeS2	Cu2FeS2	5.96%	5.28%	0.00%
GAI-2D	351	4630	Cu2S	Chalcocite	22.35%	45.60%	0.00%
GAI-2D	351	4630	Cu2Cl(OH)	Cu2Cl(OH)		0.00%	0.00%
GAI-2D	351	4630	CaCO3/Clay	CaCO3/Clay		0.00%	0.00%
GAI-2D	351	4630	FeOOH	Goethite	23.79%	1.62%	1.72%
GAI-2D	351	4630	Sulfosalt	Sulfosalt		0.00%	0.00%
GAI-2D	351	4630	FeSO4	FeSO4	1.46%	0.15%	1.06%
GAI-2D	351	4630	MnOOH	MnOOH		0.00%	0.00%
GAI-2D	351	4630	Slag	Slag		0.00%	0.00%
GAI-2D	351	4630	Brass	Brass	1.30%	2.14%	0.03%
GAI-2D	351	4630	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-3D	296	5230	AsMO	AsMO	8.88%	2.92%	84.93%
GAI-3D	296	5230	Cu	Native Copper	0.00%	0.00%	0.00%
GAI-3D	296	5230	Cu5FeS4	Bornite	2.62%	5.14%	0.00%
GAI-3D	296	5230	CuFeS2	Chalcopyrite	11.22%	9.95%	0.00%
GAI-3D	296	5230	CuFe2S3	Cubanite	16.15%	16.07%	0.00%
GAI-3D	296	5230	CuO	Tenorite	0.73%	2.12%	0.00%
GAI-3D	296	5230	CuSO4	Copper sulfate	0.00%	0.00%	0.00%
GAI-3D	296	5230	FeCuO	FeCuO	6.82%	4.32%	13.67%
GAI-3D	296	5230	CuMO	CuMO		0.00%	0.00%
GAI-3D	296	5230	Cu2FeS2	Cu2FeS2	10.54%	12.71%	0.00%
GAI-3D	296	5230	Cu2S	Chalcocite	15.95%	44.23%	0.00%
GAI-3D	296	5230	Cu2Cl(OH)	Cu2Cl(OH)		0.00%	0.00%
GAI-3D	296	5230	CaCO3/Clay	CaCO3/Clay	0.00%	0.00%	0.00%
GAI-3D	296	5230	FeOOH	Goethite	26.40%	2.45%	1.11%
GAI-3D	296	5230	Sulfosalt	Sulfosalt		0.00%	0.00%
GAI-3D	296	5230	FeSO4	FeSO4	0.69%	0.09%	0.29%
GAI-3D	296	5230	MnOOH	MnOOH	0.00%	0.00%	0.00%
GAI-3D	296	5230	Slag	Slag	0.00%	0.00%	0.00%
GAI-3D	296	5230	Brass	Brass		0.00%	0.00%
GAI-3D	296	5230	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-4D	271	4610	AsMO	AsMO	2.98%	0.85%	76.02%
GAI-4D	271	4610	Cu	Native Copper	2.35%	11.07%	0.00%
GAI-4D	271	4610	Cu5FeS4	Bornite	7.32%	12.45%	0.00%
GAI-4D	271	4610	CuFeS2	Chalcopyrite	18.72%	14.42%	0.00%
GAI-4D	271	4610	CuFe2S3	Cubanite	8.39%	7.26%	0.00%
GAI-4D	271	4610	CuO	Tenorite	1.93%	4.91%	0.00%
GAI-4D	271	4610	CuSO4	Copper sulfate	0.00%	0.00%	0.00%
GAI-4D	271	4610	FeCuO	FeCuO	0.77%	0.43%	4.13%
GAI-4D	271	4610	CuMO	CuMO		0.00%	0.00%
GAI-4D	271	4610	Cu2FeS2	Cu2FeS2	13.83%	14.50%	0.00%
GAI-4D	271	4610	Cu2S	Chalcocite	12.40%	29.89%	0.00%
GAI-4D	271	4610	Cu2Cl(OH)	Cu2Cl(OH)	1.24%	0.36%	0.00%
GAI-4D	271	4610	CaCO3/Clay	CaCO3/Clay		0.00%	0.00%
GAI-4D	271	4610	FeOOH	Goethite	23.80%	1.92%	2.66%
GAI-4D	271	4610	Sulfosalt	Sulfosalt	1.44%	1.63%	14.74%
GAI-4D	271	4610	FeSO4	FeSO4	2.18%	0.26%	2.45%
GAI-4D	271	4610	MnOOH	MnOOH	2.26%	0.06%	0.01%
GAI-4D	271	4610	Slag	Slag		0.00%	0.00%
GAI-4D	271	4610	Brass	Brass		0.00%	0.00%
GAI-4D	271	4610	**TOTAL**		**99.61%**	**100.00%**	**100.00%**
GAI-5D	82.1	1660	AsMO	AsMO	2.41%	0.54%	94.49%
GAI-5D	82.1	1660	Cu	Native Copper	1.32%	4.90%	0.00%
GAI-5D	82.1	1660	Cu5FeS4	Bornite	3.73%	5.00%	0.00%
GAI-5D	82.1	1660	CuFeS2	Chalcopyrite	7.02%	4.26%	0.00%
GAI-5D	82.1	1660	CuFe2S3	Cubanite	5.26%	3.59%	0.00%

TABLE A5-1
ELECTRON MICROPROBE ANALYSIS RESULTS FOR SUPERIOR WEST PLANT SITE

Sample ID	Arsenic Concentration (mg/kg)	Copper Concentration (mg/kg)	Mineral ID	Common Name	Frequency of Occurrence (%)	Relative Copper Mass (%)	Relative Arsenic Mass (%)
GAI-5D	82.1	1660	CuO	Tenorite	0.00%	0.00%	0.00%
GAI-5D	82.1	1660	CuSO4	Copper sulfate	4.17%	3.65%	0.00%
GAI-5D	82.1	1660	FeCuO	FeCuO	0.00%	0.00%	0.00%
GAI-5D	82.1	1660	CuMO	CuMO		0.00%	0.00%
GAI-5D	82.1	1660	Cu2FeS2	Cu2FeS2		0.00%	0.00%
GAI-5D	82.1	1660	Cu2S	Chalcocite	39.91%	75.92%	0.00%
GAI-5D	82.1	1660	Cu2Cl(OH)	Cu2Cl(OH)	0.00%	0.00%	0.00%
GAI-5D	82.1	1660	CaCO3/Clay	CaCO3/Clay	0.00%	0.00%	0.00%
GAI-5D	82.1	1660	FeOOH	Goethite	32.02%	2.04%	5.49%
GAI-5D	82.1	1660	Sulfosalt	Sulfosalt	0.00%	0.00%	0.00%
GAI-5D	82.1	1660	FeSO4	FeSO4	0.00%	0.00%	0.00%
GAI-5D	82.1	1660	MnOOH	MnOOH	4.17%	0.09%	0.02%
GAI-5D	82.1	1660	Slag	Slag	0.00%	0.00%	0.00%
GAI-5D	82.1	1660	Brass	Brass		0.00%	0.00%
GAI-5D	82.1	1660	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-6D	218	3120	AsMO	AsMO	1.79%	0.75%	54.29%
GAI-6D	218	3120	Cu	Native Copper	0.00%	0.00%	0.00%
GAI-6D	218	3120	Cu5FeS4	Bornite	15.32%	38.24%	0.00%
GAI-6D	218	3120	CuFeS2	Chalcopyrite	17.65%	19.96%	0.00%
GAI-6D	218	3120	CuFe2S3	Cubanite	17.24%	21.89%	0.00%
GAI-6D	218	3120	CuO	Tenorite	0.00%	0.00%	0.00%
GAI-6D	218	3120	CuSO4	Copper sulfate	0.00%	0.00%	0.00%
GAI-6D	218	3120	FeCuO	FeCuO	5.63%	4.55%	35.88%
GAI-6D	218	3120	CuMO	CuMO	0.00%	0.00%	0.00%
GAI-6D	218	3120	Cu2FeS2	Cu2FeS2	0.00%	0.00%	0.00%
GAI-6D	218	3120	Cu2S	Chalcocite	2.75%	9.72%	0.00%
GAI-6D	218	3120	Cu2Cl(OH)	Cu2Cl(OH)	0.00%	0.00%	0.00%
GAI-6D	218	3120	CaCO3/Clay	CaCO3/Clay	0.00%	0.00%	0.00%
GAI-6D	218	3120	FeOOH	Goethite	35.85%	4.24%	4.78%
GAI-6D	218	3120	Sulfosalt	Sulfosalt	0.00%	0.00%	0.00%
GAI-6D	218	3120	FeSO4	FeSO4	3.78%	0.65%	5.06%
GAI-6D	218	3120	MnOOH	MnOOH	0.00%	0.00%	0.00%
GAI-6D	218	3120	Slag	Slag	0.00%	0.00%	0.00%
GAI-6D	218	3120	Brass	Brass	0.00%	0.00%	0.00%
GAI-6D	218	3120	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-7D	357	5650	AsMO	AsMO	9.87%	3.53%	90.10%
GAI-7D	357	5650	Cu	Native Copper		0.00%	0.00%
GAI-7D	357	5650	Cu5FeS4	Bornite	2.04%	4.34%	0.00%
GAI-7D	357	5650	CuFeS2	Chalcopyrite	12.92%	12.42%	0.00%
GAI-7D	357	5650	CuFe2S3	Cubanite	9.29%	10.03%	0.00%
GAI-7D	357	5650	CuO	Tenorite	5.05%	16.00%	0.00%
GAI-7D	357	5650	CuSO4	Copper sulfate	2.82%	3.90%	0.00%
GAI-7D	357	5650	FeCuO	FeCuO	3.39%	2.33%	6.49%
GAI-7D	357	5650	CuMO	CuMO		0.00%	0.00%
GAI-7D	357	5650	Cu2FeS2	Cu2FeS2	1.33%	1.74%	0.00%
GAI-7D	357	5650	Cu2S	Chalcocite	13.83%	41.59%	0.00%
GAI-7D	357	5650	Cu2Cl(OH)	Cu2Cl(OH)		0.00%	0.00%
GAI-7D	357	5650	CaCO3/Clay	CaCO3/Clay		0.00%	0.00%
GAI-7D	357	5650	FeOOH	Goethite	33.42%	3.36%	1.34%
GAI-7D	357	5650	Sulfosalt	Sulfosalt		0.00%	0.00%
GAI-7D	357	5650	FeSO4	FeSO4	5.17%	0.76%	2.08%
GAI-7D	357	5650	MnOOH	MnOOH		0.00%	0.00%
GAI-7D	357	5650	Slag	Slag	0.87%	0.00%	0.00%
GAI-7D	357	5650	Brass	Brass		0.00%	0.00%
GAI-7D	357	5650	**TOTAL**		**100.00%**	**100.00%**	**100.00%**
GAI-8D	1440	33700	AsMO	AsMO	5.21%	1.30%	82.21%
GAI-8D	1440	33700	Cu	Native Copper	3.78%	15.54%	0.00%

TABLE A5-1
ELECTRON MICROPROBE ANALYSIS RESULTS FOR SUPERIOR WEST PLANT SITE

Sample ID	Arsenic Concentration (mg/kg)	Copper Concentration (mg/kg)	Mineral ID	Common Name	Frequency of Occurrence (%)	Relative Copper Mass (%)	Relative Arsenic Mass (%)
GAI-8D	1440	33700	Cu5FeS4	Bornite	9.21%	13.66%	0.00%
GAI-8D	1440	33700	CuFeS2	Chalcopyrite	17.33%	11.65%	0.00%
GAI-8D	1440	33700	CuFe2S3	Cubanite	8.68%	6.55%	0.00%
GAI-8D	1440	33700	CuO	Tenorite	4.82%	10.68%	0.00%
GAI-8D	1440	33700	CuSO4	Copper sulfate	7.38%	7.15%	0.00%
GAI-8D	1440	33700	FeCuO	FeCuO	1.57%	0.76%	5.21%
GAI-8D	1440	33700	CuMO	CuMO	0.00%	0.00%	0.00%
GAI-8D	1440	33700	Cu2FeS2	Cu2FeS2	4.09%	3.74%	0.00%
GAI-8D	1440	33700	Cu2S	Chalcocite	12.28%	25.83%	0.00%
GAI-8D	1440	33700	Cu2Cl(OH)	Cu2Cl(OH)	0.00%	0.00%	0.00%
GAI-8D	1440	33700	CaCO3/Clay	CaCO3/Clay	0.00%	0.00%	0.00%
GAI-8D	1440	33700	FeOOH	Goethite	20.45%	1.44%	1.41%
GAI-8D	1440	33700	Sulfosalt	Sulfosalt	1.39%	1.37%	8.82%
GAI-8D	1440	33700	FeSO4	FeSO4	3.38%	0.35%	2.35%
GAI-8D	1440	33700	MnOOH	MnOOH	0.00%	0.00%	0.00%
GAI-8D	1440	33700	Slag	Slag	0.00%	0.00%	0.00%
GAI-8D	1440	33700	Brass	Brass	0.00%	0.00%	0.00%
GAI-8D	1440	33700	**TOTAL**		**99.56%**	**100.00%**	**100.00%**
GAI-9D	160	1910	AsMO	AsMO	3.09%	2.03%	63.44%
GAI-9D	160	1910	Cu	Native Copper	0.00%	0.00%	0.00%
GAI-9D	160	1910	Cu5FeS4	Bornite	1.29%	5.03%	0.00%
GAI-9D	160	1910	CuFeS2	Chalcopyrite	0.00%	0.00%	0.00%
GAI-9D	160	1910	CuFe2S3	Cubanite	18.81%	37.35%	0.00%
GAI-9D	160	1910	CuO	Tenorite	0.00%	0.00%	0.00%
GAI-9D	160	1910	CuSO4	Copper sulfate	0.00%	0.00%	0.00%
GAI-9D	160	1910	FeCuO	FeCuO	7.22%	9.12%	31.01%
GAI-9D	160	1910	CuMO	CuMO		0.00%	0.00%
GAI-9D	160	1910	Cu2FeS2	Cu2FeS2	3.61%	8.68%	0.00%
GAI-9D	160	1910	Cu2S	Chalcocite	1.29%	7.13%	0.00%
GAI-9D	160	1910	Cu2Cl(OH)	Cu2Cl(OH)		0.00%	0.00%
GAI-9D	160	1910	CaCO3/Clay	CaCO3/Clay		0.00%	0.00%
GAI-9D	160	1910	FeOOH	Goethite	60.31%	11.15%	5.42%
GAI-9D	160	1910	Sulfosalt	Sulfosalt	0.00%	0.00%	0.00%
GAI-9D	160	1910	FeSO4	FeSO4	0.00%	0.00%	0.00%
GAI-9D	160	1910	MnOOH	MnOOH		0.00%	0.00%
GAI-9D	160	1910	Slag	Slag		0.00%	0.00%
GAI-9D	160	1910	Brass	Brass	4.38%	19.51%	0.13%
GAI-9D	160	1910	**TOTAL**		**100.00%**	**100.00%**	**100.00%**

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
595	AsMO	Liberated	8	
595	AsMO	Rimming	12	
595	AsMO	Liberated	10	
595	AsMO	Liberated	7	
595	AsMO	Liberated	4	
595	AsMO	Liberated	4	
595	AsMO	Liberated	4	
595	AsMO	Liberated	4	
595	AsMO	Liberated	4	
595	AsMO	Liberated	4	
595	AsMO	Liberated	55	
595	AsMO	Liberated	4	
595	AsMO	Liberated	4	
595	AsMO	Liberated	4	
595	AsMO	Liberated	38	
595	AsMO	Liberated	4	
595	AsMO	Liberated	4	
595	AsMO	Liberated	4	
595	AsMO	Liberated	4	
595	AsMO	Liberated	4	
595	AsMO	Liberated	4	5.44%
595	Cu5FeS4	Liberated	16	
595	Cu5FeS4	Liberated	38	
595	Cu5FeS4	Liberated	22	
595	Cu5FeS4	Liberated	20	
595	Cu5FeS4	Liberated	8	
595	Cu5FeS4	Liberated	14	3.38%
595	CuFeS2	Liberated	32	
595	CuFeS2	Liberated	30	
595	CuFeS2	Liberated	10	
595	CuFeS2	Liberated	50	
595	CuFeS2	Liberated	46	
595	CuFeS2	Liberated	12	
595	CuFeS2	Cemented	32	
595	CuFeS2	Liberated	24	
595	CuFeS2	Liberated	11	
595	CuFeS2	Liberated	11	
595	CuFeS2	Liberated	4	
595	CuFeS2	Liberated	16	
595	CuFeS2	Liberated	65	
595	CuFeS2	Liberated	18	
595	CuFeS2	Liberated	80	
595	CuFeS2	Liberated	15	
595	CuFeS2	Cemented	22	
595	CuFeS2	Cemented	8	
595	CuFeS2	Liberated	25	
595	CuFeS2	Liberated	36	
595	CuFeS2	Inclusion	13	
595	CuFeS2	Inclusion	3	
595	CuFeS2	Inclusion	3	
595	CuFeS2	Inclusion	3	
595	CuFeS2	Inclusion	3	
595	CuFeS2	Liberated	7	16.58%
595	Cu2FeS2	Liberated	45	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
595	Cu2FeS2	Cemented	12	
595	Cu2FeS2	Liberated	14	
595	Cu2FeS2	Liberated	25	
595	Cu2FeS2	Liberated	26	
595	Cu2FeS2	Liberated	35	4.49%
595	CuFe2S3	Liberated	30	
595	CuFe2S3	Liberated	12	
595	CuFe2S3	Liberated	25	
595	CuFe2S3	Liberated	38	
595	CuFe2S3	Liberated	15	
595	CuFe2S3	Liberated	34	
595	CuFe2S3	Liberated	40	
595	CuFe2S3	Liberated	46	6.87%
595	CuSO4	Liberated	8	
595	CuSO4	Liberated	20	
595	CuSO4	Liberated	14	1.20%
595	FeOOH	Liberated	40	
595	FeOOH	Liberated	5	
595	FeOOH	Liberated	8	
595	FeOOH	Liberated	14	
595	FeOOH	Liberated	20	
595	FeOOH	Liberated	18	
595	FeOOH	Liberated	12	
595	FeOOH	Liberated	30	
595	FeOOH	Liberated	65	
595	FeOOH	Cemented	75	
595	FeOOH	Liberated	34	
595	FeOOH	Liberated	45	
595	FeOOH	Liberated	15	
595	FeOOH	Liberated	105	
595	FeOOH	Liberated	40	
595	FeOOH	Liberated	8	
595	FeOOH	Liberated	20	
595	FeOOH	Liberated	40	
595	FeOOH	Liberated	13	
595	FeOOH	Liberated	9	
595	FeOOH	Liberated	12	
595	FeOOH	Liberated	50	
595	FeOOH	Cemented	9	
595	FeOOH	Liberated	17	
595	FeOOH	Liberated	20	
595	FeOOH	Cemented	14	
595	FeOOH	Cemented	48	
595	FeOOH	Liberated	7	
595	FeOOH	Liberated	19	
595	FeOOH	Cemented	26	
595	FeOOH	Liberated	50	
595	FeOOH	Liberated	30	
595	FeOOH	Liberated	40	
595	FeOOH	Liberated	10	
595	FeOOH	Liberated	10	
595	FeOOH	Liberated	10	
595	FeOOH	Liberated	38	
595	FeOOH	Liberated	16	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
595	FeOOH	Liberated	105	
595	FeOOH	Cemented	92	
595	FeOOH	Liberated	55	
595	FeOOH	Liberated	50	38.48%
595	FeCuOOH	Liberated	5	
595	FeCuOOH	Liberated	20	
595	FeCuOOH	Liberated	25	
595	FeCuOOH	Liberated	10	1.72%
595	Cu2S	Liberated	36	
595	Cu2S	Liberated	55	
595	Cu2S	Inclusion	28	
595	Cu2S	Liberated	48	
595	Cu2S	Liberated	58	
595	Cu2S	Liberated	32	
595	Cu2S	Liberated	95	
595	Cu2S	Inclusion	32	
595	Cu2S	Inclusion	6	11.17%
595	CuO	Inclusion	12	
595	CuO	Inclusion	45	
595	CuO	Liberated	58	3.29%
595	FeSO4	Liberated	85	
595	FeSO4	Liberated	90	
595	FeSO4	Liberated	12	
595	FeSO4	Liberated	48	
595	FeSO4	Inclusion	11	
595	FeSO4	Liberated	12	7.39%
595	**TOTAL**		3493	
596	CuSO4	Rimming	19	4.17%
596	AsMO	Liberated	11	2.41%
596	Cu5FeS4	Rimming	3	
596	Cu5FeS4	Cemented	2	
596	Cu5FeS4	Cemented	2	
596	Cu5FeS4	Cemented	2	
596	Cu5FeS4	Rimming	5	
596	Cu5FeS4	Rimming	3	3.73%
596	CuFeS2	Liberated	32	7.02%
596	CuFe2S3	Inclusion	6	
596	CuFe2S3	Inclusion	6	
596	CuFe2S3	Inclusion	6	
596	CuFe2S3	Inclusion	6	5.26%
596	FeOOH	Cemented	22	
596	FeOOH	Liberated	12	
596	FeOOH	Rimming	17	
596	FeOOH	Cemented	5	
596	FeOOH	Liberated	90	32.02%
596	Cu2S	Rimming	11	
596	Cu2S	Rimming	5	
596	Cu2S	Rimming	5	
596	Cu2S	Rimming	6	
596	Cu2S	Rimming	6	
596	Cu2S	Rimming	2	
596	Cu2S	Rimming	2	
596	Cu2S	Rimming	2	
596	Cu2S	Rimming	2	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
596	Cu2S	Rimming	2	
596	Cu2S	Rimming	2	
596	Cu2S	Rimming	2	
596	Cu2S	Rimming	2	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	2	
596	Cu2S	Cemented	2	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Rimming	8	
596	Cu2S	Rimming	7	
596	Cu2S	Rimming	6	
596	Cu2S	Liberated	4	
596	Cu2S	Rimming	7	
596	Cu2S	Rimming	7	
596	Cu2S	Rimming	7	
596	Cu2S	Rimming	6	
596	Cu2S	Rimming	6	
596	Cu2S	Rimming	9	
596	Cu2S	Rimming	12	
596	Cu2S	Rimming	5	
596	Cu2S	Rimming	8	
596	Cu2S	Cemented	10	
596	Cu2S	Cemented	5	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	
596	Cu2S	Cemented	1	39.91%
596	MnOOH	Cemented	19	4.17%
596	Native Copper	Liberated	6	1.32%
596	**TOTAL**		456	
597	AsMO	Liberated	1	
597	AsMO	Cemented	18	
597	AsMO	Cemented	28	
597	AsMO	Liberated	32	
597	AsMO	Liberated	23	
597	AsMO	Liberated	20	
597	AsMO	Liberated	22	
597	AsMO	Liberated	12	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
597	AsMO	Cemented	38	1.37%
597	Native Copper	Inclusion	60	
597	Native Copper	Inclusion	38	
597	Native Copper	Inclusion	28	
597	Native Copper	Inclusion	42	
597	Native Copper	Inclusion	17	
597	Native Copper	Inclusion	7	
597	Native Copper	Inclusion	35	
597	Native Copper	Inclusion	32	
597	Native Copper	Liberated	60	
597	Native Copper	Inclusion	20	
597	Native Copper	Inclusion	25	
597	Native Copper	Inclusion	1	
597	Native Copper	Inclusion	1	
597	Native Copper	Inclusion	1	
597	Native Copper	Inclusion	1	
597	Native Copper	Inclusion	1	
597	Native Copper	Inclusion	1	
597	Native Copper	Inclusion	45	
597	Native Copper	Inclusion	5	
597	Native Copper	Rimming	85	3.55%
597	Cu2FeS2	Liberated	90	
597	Cu2FeS2	Liberated	60	
597	Cu2FeS2	Liberated	28	
597	Cu2FeS2	Rimming	120	
597	Cu2FeS2	Liberated	85	
597	Cu2FeS2	Liberated	14	
597	Cu2FeS2	Cemented	55	
597	Cu2FeS2	Liberated	42	
597	Cu2FeS2	Liberated	110	
597	Cu2FeS2	Liberated	8	
597	Cu2FeS2	Liberated	90	
597	Cu2FeS2	Liberated	90	5.58%
597	Cu2S	Rimming	28	
597	Cu2S	Rimming	12	
597	Cu2S	Liberated	40	
597	Cu2S	Inclusion	9	
597	Cu2S	Liberated	100	
597	Cu2S	Liberated	16	
597	Cu2S	Liberated	95	
597	Cu2S	Liberated	85	
597	Cu2S	Liberated	78	
597	Cu2S	Liberated	65	
597	Cu2S	Liberated	80	
597	Cu2S	Liberated	45	
597	Cu2S	Liberated	24	
597	Cu2S	Liberated	96	
597	Cu2S	Liberated	120	
597	Cu2S	Liberated	90	
597	Cu2S	Liberated	82	
597	Cu2S	Liberated	95	
597	Cu2S	Liberated	115	
597	Cu2S	Cemented	25	
597	Cu2S	Liberated	92	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
597	Cu2S	Liberated	40	
597	Cu2S	Liberated	85	
597	Cu2S	Liberated	14	
597	Cu2S	Liberated	85	
597	Cu2S	Liberated	34	
597	Cu2S	Liberated	26	
597	Cu2S	Liberated	102	
597	Cu2S	Liberated	60	
597	Cu2S	Liberated	100	
597	Cu2S	Liberated	21	
597	Cu2S	Liberated	62	
597	Cu2S	Liberated	48	
597	Cu2S	Liberated	90	
597	Cu2S	Liberated	62	
597	Cu2S	Liberated	105	
597	Cu2S	Liberated	105	
597	Cu2S	Liberated	85	
597	Cu2S	Liberated	16	
597	Cu2S	Inclusion	21	
597	Cu2S	Liberated	40	
597	Cu2S	Liberated	90	
597	Cu2S	Rimming	30	
597	Cu2S	Liberated	35	
597	Cu2S	Liberated	115	
597	Cu2S	Liberated	110	
597	Cu2S	Liberated	88	
597	Cu2S	Liberated	20	
597	Cu2S	Rimming	55	
597	Cu2S	Liberated	45	
597	Cu2S	Liberated	40	
597	Cu2S	Liberated	100	
597	Cu2S	Liberated	80	
597	Cu2S	Liberated	55	
597	Cu2S	Liberated	45	
597	Cu2S	Liberated	85	
597	Cu2S	Liberated	93	
597	Cu2S	Liberated	60	
597	Cu2S	Inclusion	22	
597	Cu2S	Liberated	25	
597	Cu2S	Liberated	85	
597	Cu2S	Liberated	100	
597	Cu2S	Liberated	85	
597	Cu2S	Liberated	89	
597	Cu2S	Liberated	110	
597	Cu2S	Rimming	40	
597	Cu2S	Liberated	40	
597	Cu2S	Liberated	90	
597	Cu2S	Rimming	52	
597	Cu2S	Liberated	45	
597	Cu2S	Liberated	90	
597	Cu2S	Liberated	85	
597	Cu2S	Liberated	80	33.63%
597	Cu5FeS4	Liberated	35	
597	Cu5FeS4	Liberated	45	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
597	Cu5FeS4	Rimming	8	
597	Cu5FeS4	Liberated	128	
597	Cu5FeS4	Inclusion	14	
597	Cu5FeS4	Liberated	35	
597	Cu5FeS4	Liberated	87	
597	Cu5FeS4	Liberated	38	
597	Cu5FeS4	Liberated	35	
597	Cu5FeS4	Inclusion	35	
597	Cu5FeS4	Liberated	24	
597	Cu5FeS4	Liberated	90	
597	Cu5FeS4	Liberated	60	
597	Cu5FeS4	Liberated	96	
597	Cu5FeS4	Liberated	95	
597	Cu5FeS4	Liberated	58	
597	Cu5FeS4	Rimming	36	
597	Cu5FeS4	Liberated	120	
597	Cu5FeS4	Liberated	118	
597	Cu5FeS4	Liberated	15	8.25%
597	CuFe2S3	Liberated	15	
597	CuFe2S3	Liberated	15	
597	CuFe2S3	Liberated	40	
597	CuFe2S3	Liberated	10	
597	CuFe2S3	Liberated	10	
597	CuFe2S3	Liberated	50	
597	CuFe2S3	Cemented	7	
597	CuFe2S3	Cemented	7	
597	CuFe2S3	Cemented	7	
597	CuFe2S3	Cemented	7	
597	CuFe2S3	Cemented	7	
597	CuFe2S3	Cemented	7	
597	CuFe2S3	Liberated	50	
597	CuFe2S3	Liberated	110	
597	CuFe2S3	Liberated	32	
597	CuFe2S3	Liberated	90	
597	CuFe2S3	Liberated	49	
597	CuFe2S3	Liberated	22	
597	CuFe2S3	Liberated	88	
597	CuFe2S3	Liberated	90	
597	CuFe2S3	Liberated	22	
597	CuFe2S3	Liberated	40	
597	CuFe2S3	Liberated	55	
597	CuFe2S3	Liberated	102	
597	CuFe2S3	Inclusion	50	
597	CuFe2S3	Liberated	90	7.55%
597	CuFeS2	Liberated	105	
597	CuFeS2	Liberated	108	
597	CuFeS2	Liberated	10	
597	CuFeS2	Cemented	6	
597	CuFeS2	Liberated	22	
597	CuFeS2	Liberated	105	
597	CuFeS2	Liberated	22	
597	CuFeS2	Liberated	110	
597	CuFeS2	Liberated	130	
597	CuFeS2	Liberated	40	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
597	CuFeS2	Liberated	80	
597	CuFeS2	Liberated	28	
597	CuFeS2	Liberated	105	
597	CuFeS2	Liberated	100	
597	CuFeS2	Liberated	27	
597	CuFeS2	Liberated	13	
597	CuFeS2	Liberated	18	
597	CuFeS2	Liberated	60	
597	CuFeS2	Liberated	95	
597	CuFeS2	Liberated	115	
597	CuFeS2	Liberated	17	
597	CuFeS2	Liberated	45	
597	CuFeS2	Liberated	32	
597	CuFeS2	Liberated	15	
597	CuFeS2	Liberated	26	
597	CuFeS2	Liberated	26	
597	CuFeS2	Liberated	105	
597	CuFeS2	Cemented	125	
597	CuFeS2	Liberated	98	
597	CuFeS2	Liberated	122	
597	CuFeS2	Liberated	38	
597	CuFeS2	Liberated	55	
597	CuFeS2	Liberated	50	
597	CuFeS2	Liberated	50	
597	CuFeS2	Inclusion	78	
597	CuFeS2	Liberated	14	
597	CuFeS2	Liberated	16	
597	CuFeS2	Liberated	22	
597	CuFeS2	Liberated	115	
597	CuFeS2	Liberated	35	
597	CuFeS2	Liberated	15	
597	CuFeS2	Liberated	30	17.09%
597	CuO	Liberated	40	
597	CuO	Rimming	38	
597	CuO	Liberated	60	
597	CuO	Rimming	30	
597	CuO	Inclusion	7	
597	CuO	Liberated	9	
597	CuO	Liberated	74	
597	CuO	Liberated	95	
597	CuO	Rimming	20	
597	CuO	Liberated	10	
597	CuO	Inclusion	20	
597	CuO	Liberated	43	
597	CuO	Inclusion	30	
597	CuO	Rimming	40	
597	CuO	Liberated	26	
597	CuO	Liberated	90	
597	CuO	Inclusion	20	
597	CuO	Liberated	30	
597	CuO	Rimming	60	
597	CuO	Rimming	40	
597	CuO	Inclusion	40	5.79%
597	CuSO4	Rimming	15	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
597	CuSO4	Cemented	25	
597	CuSO4	Liberated	85	
597	CuSO4	Rimming	20	
597	CuSO4	Rimming	15	
597	CuSO4	Liberated	22	
597	CuSO4	Rimming	15	
597	CuSO4	Liberated	22	1.54%
597	FeOOH	Liberated	35	
597	FeOOH	Liberated	14	
597	FeOOH	Liberated	70	
597	FeOOH	Cemented	24	
597	FeOOH	Cemented	36	
597	FeOOH	Liberated	11	
597	FeOOH	Liberated	28	
597	FeOOH	Liberated	40	
597	FeOOH	Cemented	18	
597	FeOOH	Liberated	12	
597	FeOOH	Liberated	11	
597	FeOOH	Liberated	14	
597	FeOOH	Liberated	10	
597	FeOOH	Cemented	23	
597	FeOOH	Liberated	50	
597	FeOOH	Cemented	12	
597	FeOOH	Rimming	105	
597	FeOOH	Liberated	85	
597	FeOOH	Cemented	24	
597	FeOOH	Liberated	12	
597	FeOOH	Liberated	12	
597	FeOOH	Liberated	12	
597	FeOOH	Liberated	20	
597	FeOOH	Liberated	15	
597	FeOOH	Liberated	15	
597	FeOOH	Liberated	100	
597	FeOOH	Liberated	15	
597	FeOOH	Liberated	102	
597	FeOOH	Rimming	45	
597	FeOOH	Cemented	21	
597	FeOOH	Liberated	130	
597	FeOOH	Liberated	120	
597	FeOOH	Rimming	48	
597	FeOOH	Liberated	80	
597	FeOOH	Liberated	80	
597	FeOOH	Liberated	105	10.94%
597	FeCuOOH	Liberated	7	
597	FeCuOOH	Liberated	26	
597	FeCuOOH	Cemented	15	
597	FeCuOOH	Liberated	15	
597	FeCuOOH	Liberated	29	
597	FeCuOOH	Liberated	14	
597	FeCuOOH	Liberated	37	
597	FeCuOOH	Liberated	15	
597	FeCuOOH	Liberated	30	
597	FeCuOOH	Liberated	35	1.57%
597	Sulfosalt	Liberated	20	0.14%

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
597	FeSO4	Liberated	25	
597	FeSO4	Liberated	10	
597	FeSO4	Cemented	55	
597	FeSO4	Liberated	92	
597	FeSO4	Liberated	26	
597	FeSO4	Liberated	24	
597	FeSO4	Liberated	85	
597	FeSO4	Rimming	15	
597	FeSO4	Cemented	36	
597	FeSO4	Cemented	28	
597	FeSO4	Liberated	32	3.01%
597	**TOTAL**		14206	
598	AsMO	Cemented	108	2.98%
598	Cu5FeS4	Inclusion	8	
598	Cu5FeS4	Rimming	18	
598	Cu5FeS4	Liberated	9	
598	Cu5FeS4	Liberated	130	
598	Cu5FeS4	Liberated	30	
598	Cu5FeS4	Liberated	70	7.32%
598	CuFeS2	Liberated	42	
598	CuFeS2	Liberated	85	
598	CuFeS2	Liberated	80	
598	CuFeS2	Liberated	32	
598	CuFeS2	Liberated	60	
598	CuFeS2	Liberated	62	
598	CuFeS2	Liberated	65	
598	CuFeS2	Liberated	13	
598	CuFeS2	Cemented	13	
598	CuFeS2	Cemented	28	
598	CuFeS2	Cemented	8	
598	CuFeS2	Cemented	12	
598	CuFeS2	Liberated	20	
598	CuFeS2	Liberated	50	
598	CuFeS2	Liberated	100	
598	CuFeS2	Liberated	8	18.72%
598	Cu2FeS2	Liberated	90	
598	Cu2FeS2	Liberated	50	
598	Cu2FeS2	Liberated	120	
598	Cu2FeS2	Inclusion	6	
598	Cu2FeS2	Inclusion	6	
598	Cu2FeS2	Inclusion	6	
598	Cu2FeS2	Inclusion	6	
598	Cu2FeS2	Rimming	51	
598	Cu2FeS2	Inclusion	9	
598	Cu2FeS2	Inclusion	9	
598	Cu2FeS2	Inclusion	9	
598	Cu2FeS2	Inclusion	9	
598	Cu2FeS2	Inclusion	23	
598	Cu2FeS2	Liberated	32	
598	Cu2FeS2	Rimming	75	13.83%
598	CuFe2S3	Liberated	100	
598	CuFe2S3	Rimming	48	
598	CuFe2S3	Liberated	105	
598	CuFe2S3	Cemented	38	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
598	CuFe2S3	Liberated	13	8.39%
598	FeOOH	Cemented	38	
598	FeOOH	Liberated	3	
598	FeOOH	Liberated	22	
598	FeOOH	Cemented	40	
598	FeOOH	Liberated	22	
598	FeOOH	Liberated	6	
598	FeOOH	Cemented	126	
598	FeOOH	Cemented	32	
598	FeOOH	Rimming	21	
598	FeOOH	Liberated	27	
598	FeOOH	Liberated	100	
598	FeOOH	Cemented	17	
598	FeOOH	Cemented	11	
598	FeOOH	Liberated	9	
598	FeOOH	Liberated	105	
598	FeOOH	Cemented	55	
598	FeOOH	Liberated	150	
598	FeOOH	Cemented	78	23.80%
598	FeCuOOH	Liberated	28	0.77%
598	Cu2S	Rimming	2	
598	Cu2S	Rimming	3	
598	Cu2S	Liberated	85	
598	Cu2S	Liberated	6	
598	Cu2S	Liberated	32	
598	Cu2S	Liberated	8	
598	Cu2S	Liberated	108	
598	Cu2S	Liberated	105	
598	Cu2S	Liberated	50	
598	Cu2S	Liberated	50	12.40%
598	MnOOH	Cemented	82	2.26%
598	Native Copper	Liberated	45	
598	Native Copper	Inclusion	40	2.35%
598	PbC14	Liberated	45	1.24%
598	CuO	Liberated	29	
598	CuO	Inclusion	9	
598	CuO	Liberated	32	1.93%
598	Sulfosalt	Liberated	52	1.44%
598	FeSO4	Liberated	12	
598	FeSO4	Liberated	14	
598	FeSO4	Liberated	27	
598	FeSO4	Cemented	26	2.18%
598	ZnS	Liberated	14	0.39%
598	**TOTAL**		3622	
599	CuSO4	Liberated	30	
599	CuSO4	Cemented	120	
599	CuSO4	Liberated	28	
599	CuSO4	Rimming	26	1.37%
599	AsMO	Liberated	27	
599	AsMO	Liberated	12	
599	AsMO	Liberated	38	
599	AsMO	Liberated	95	
599	AsMO	Liberated	20	
599	AsMO	Cemented	25	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
599	AsMO	Cemented	10	
599	AsMO	Cemented	10	
599	AsMO	Cemented	10	
599	AsMO	Cemented	10	
599	AsMO	Cemented	10	
599	AsMO	Cemented	10	
599	AsMO	Cemented	10	
599	AsMO	Cemented	10	
599	AsMO	Liberated	22	2.15%
599	Cu5FeS4	Liberated	92	
599	Cu5FeS4	Liberated	21	
599	Cu5FeS4	Liberated	27	
599	Cu5FeS4	Liberated	12	
599	Cu5FeS4	Inclusion	23	
599	Cu5FeS4	Liberated	80	
599	Cu5FeS4	Liberated	78	
599	Cu5FeS4	Liberated	28	
599	Cu5FeS4	Liberated	50	
599	Cu5FeS4	Inclusion	40	
599	Cu5FeS4	Inclusion	12	
599	Cu5FeS4	Liberated	90	
599	Cu5FeS4	Liberated	19	
599	Cu5FeS4	Liberated	14	
599	Cu5FeS4	Liberated	19	4.07%
599	Calcite	Cemented	150	1.01%
599	CuFeS2	Liberated	125	
599	CuFeS2	Liberated	55	
599	CuFeS2	Liberated	50	
599	CuFeS2	Liberated	80	
599	CuFeS2	Liberated	110	
599	CuFeS2	Liberated	80	
599	CuFeS2	Liberated	85	
599	CuFeS2	Liberated	50	
599	CuFeS2	Liberated	110	
599	CuFeS2	Liberated	80	
599	CuFeS2	Liberated	25	
599	CuFeS2	Liberated	85	
599	CuFeS2	Liberated	40	
599	CuFeS2	Rimming	30	
599	CuFeS2	Liberated	22	
599	CuFeS2	Liberated	12	
599	CuFeS2	Liberated	55	
599	CuFeS2	Liberated	55	
599	CuFeS2	Liberated	10	
599	CuFeS2	Liberated	8	
599	CuFeS2	Liberated	22	
599	CuFeS2	Liberated	14	
599	CuFeS2	Liberated	40	
599	CuFeS2	Liberated	90	
599	CuFeS2	Liberated	90	
599	CuFeS2	Cemented	85	
599	CuFeS2	Liberated	55	
599	CuFeS2	Liberated	49	
599	CuFeS2	Rimming	26	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
599	CuFeS2	Liberated	50	
599	CuFeS2	Liberated	85	
599	CuFeS2	Liberated	18	
599	CuFeS2	Liberated	98	
599	CuFeS2	Liberated	98	
599	CuFeS2	Liberated	52	
599	CuFeS2	Liberated	96	
599	CuFeS2	Liberated	20	
599	CuFeS2	Liberated	50	
599	CuFeS2	Liberated	38	
599	CuFeS2	Liberated	46	
599	CuFeS2	Liberated	55	
599	CuFeS2	Liberated	30	
599	CuFeS2	Liberated	60	16.39%
599	Cu2FeS2	Liberated	80	
599	Cu2FeS2	Rimming	98	
599	Cu2FeS2	Liberated	38	
599	Cu2FeS2	Liberated	90	
599	Cu2FeS2	Liberated	110	
599	Cu2FeS2	Liberated	50	
599	Cu2FeS2	Liberated	86	
599	Cu2FeS2	Liberated	42	
599	Cu2FeS2	Liberated	22	
599	Cu2FeS2	Liberated	55	
599	Cu2FeS2	Liberated	12	
599	Cu2FeS2	Rimming	85	
599	Cu2FeS2	Liberated	28	
599	Cu2FeS2	Liberated	90	
599	Cu2FeS2	Liberated	75	
599	Cu2FeS2	Liberated	20	
599	Cu2FeS2	Liberated	70	
599	Cu2FeS2	Liberated	60	
599	Cu2FeS2	Liberated	50	7.82%
599	CuFe2S3	Liberated	60	
599	CuFe2S3	Liberated	125	
599	CuFe2S3	Liberated	50	
599	CuFe2S3	Liberated	31	
599	CuFe2S3	Liberated	55	
599	CuFe2S3	Liberated	47	
599	CuFe2S3	Inclusion	50	
599	CuFe2S3	Liberated	48	
599	CuFe2S3	Liberated	25	
599	CuFe2S3	Liberated	105	
599	CuFe2S3	Liberated	85	
599	CuFe2S3	Liberated	50	
599	CuFe2S3	Liberated	85	
599	CuFe2S3	Liberated	85	
599	CuFe2S3	Liberated	32	
599	CuFe2S3	Liberated	55	
599	CuFe2S3	Rimming	80	
599	CuFe2S3	Liberated	48	
599	CuFe2S3	Liberated	30	
599	CuFe2S3	Liberated	50	8.05%
599	FeOOH	Liberated	42	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
599	FeOOH	Liberated	20	
599	FeOOH	Liberated	85	
599	FeOOH	Liberated	48	
599	FeOOH	Liberated	35	
599	FeOOH	Liberated	22	
599	FeOOH	Liberated	37	
599	FeOOH	Liberated	130	
599	FeOOH	Liberated	25	
599	FeOOH	Rimming	50	
599	FeOOH	Liberated	78	
599	FeOOH	Cemented	102	
599	FeOOH	Liberated	23	
599	FeOOH	Liberated	23	
599	FeOOH	Liberated	22	
599	FeOOH	Liberated	40	
599	FeOOH	Liberated	55	
599	FeOOH	Liberated	28	
599	FeOOH	Liberated	25	
599	FeOOH	Liberated	40	
599	FeOOH	Liberated	24	
599	FeOOH	Liberated	15	
599	FeOOH	Rimming	50	
599	FeOOH	Liberated	55	
599	FeOOH	Liberated	11	
599	FeOOH	Cemented	35	
599	FeOOH	Rimming	20	
599	FeOOH	Liberated	35	
599	FeOOH	Liberated	90	
599	FeOOH	Liberated	95	
599	FeOOH	Liberated	75	
599	FeOOH	Rimming	55	
599	FeOOH	Liberated	28	
599	FeOOH	Liberated	60	
599	FeOOH	Liberated	130	
599	FeOOH	Liberated	11	
599	FeOOH	Liberated	19	
599	FeOOH	Liberated	28	
599	FeOOH	Liberated	48	
599	FeOOH	Liberated	24	
599	FeOOH	Liberated	31	
599	FeOOH	Liberated	48	
599	FeOOH	Liberated	50	
599	FeOOH	Liberated	26	
599	FeOOH	Rimming	100	
599	FeOOH	Liberated	45	14.40%
599	FeCuOOH	Liberated	48	
599	FeCuOOH	Liberated	21	
599	FeCuOOH	Liberated	35	0.70%
599	Cu2S	Liberated	48	
599	Cu2S	Liberated	11	
599	Cu2S	Liberated	40	
599	Cu2S	Inclusion	45	
599	Cu2S	Liberated	80	
599	Cu2S	Liberated	11	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
599	Cu2S	Liberated	105	
599	Cu2S	Liberated	58	
599	Cu2S	Inclusion	40	
599	Cu2S	Liberated	90	
599	Cu2S	Liberated	100	
599	Cu2S	Liberated	95	
599	Cu2S	Liberated	80	
599	Cu2S	Inclusion	14	
599	Cu2S	Liberated	105	
599	Cu2S	Liberated	90	
599	Cu2S	Liberated	30	
599	Cu2S	Liberated	70	
599	Cu2S	Liberated	80	
599	Cu2S	Liberated	30	
599	Cu2S	Liberated	27	
599	Cu2S	Liberated	130	
599	Cu2S	Liberated	130	
599	Cu2S	Liberated	28	
599	Cu2S	Liberated	78	
599	Cu2S	Liberated	55	
599	Cu2S	Liberated	45	
599	Cu2S	Liberated	30	
599	Cu2S	Liberated	50	
599	Cu2S	Liberated	80	
599	Cu2S	Liberated	50	
599	Cu2S	Liberated	105	
599	Cu2S	Liberated	48	
599	Cu2S	Liberated	90	
599	Cu2S	Liberated	85	
599	Cu2S	Liberated	30	
599	Cu2S	Liberated	14	
599	Cu2S	Liberated	60	
599	Cu2S	Liberated	12	
599	Cu2S	Liberated	38	
599	Cu2S	Rimming	12	
599	Cu2S	Rimming	20	
599	Cu2S	Liberated	30	
599	Cu2S	Liberated	34	
599	Cu2S	Liberated	80	
599	Cu2S	Liberated	95	
599	Cu2S	Inclusion	55	
599	Cu2S	Liberated	85	
599	Cu2S	Liberated	30	
599	Cu2S	Liberated	85	
599	Cu2S	Liberated	60	
599	Cu2S	Liberated	50	
599	Cu2S	Liberated	38	
599	Cu2S	Liberated	50	
599	Cu2S	Rimming	25	
599	Cu2S	Liberated	50	
599	Cu2S	Liberated	42	
599	Cu2S	Liberated	95	
599	Cu2S	Liberated	30	
599	Cu2S	Liberated	26	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
599	Cu2S	Liberated	38	
599	Cu2S	Liberated	90	
599	Cu2S	Liberated	48	
599	Cu2S	Liberated	20	
599	Cu2S	Liberated	85	
599	Cu2S	Liberated	13	
599	Cu2S	Liberated	30	
599	Cu2S	Liberated	36	
599	Cu2S	Liberated	20	
599	Cu2S	Liberated	20	
599	Cu2S	Liberated	38	
599	Cu2S	Liberated	21	
599	Cu2S	Liberated	20	
599	Cu2S	Liberated	20	
599	Cu2S	Liberated	40	
599	Cu2S	Liberated	50	
599	Cu2S	Rimming	15	
599	Cu2S	Liberated	20	
599	Cu2S	Liberated	50	
599	Cu2S	Liberated	35	
599	Cu2S	Liberated	90	
599	Cu2S	Liberated	40	
599	Cu2S	Liberated	30	
599	Cu2S	Liberated	36	
599	Cu2S	Liberated	32	
599	Cu2S	Liberated	95	29.84%
599	Native Copper	Liberated	60	
599	Native Copper	Inclusion	60	
599	Native Copper	Inclusion	35	
599	Native Copper	Inclusion	35	
599	Native Copper	Inclusion	12	
599	Native Copper	Inclusion	45	
599	Native Copper	Inclusion	70	
599	Native Copper	Liberated	95	
599	Native Copper	Rimming	38	
599	Native Copper	Inclusion	27	
599	Native Copper	Inclusion	25	3.38%
599	PbMO	Liberated	12	0.08%
599	CuO	Liberated	35	
599	CuO	Liberated	64	
599	CuO	Liberated	43	
599	CuO	Inclusion	25	
599	CuO	Inclusion	50	
599	CuO	Inclusion	28	
599	CuO	Liberated	39	
599	CuO	Liberated	31	
599	CuO	Inclusion	24	
599	CuO	Inclusion	35	
599	CuO	Liberated	60	
599	CuO	Inclusion	30	
599	CuO	Liberated	48	
599	CuO	Liberated	80	
599	CuO	Liberated	50	
599	CuO	Liberated	55	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
599	CuO	Liberated	16	
599	CuO	Liberated	40	
599	CuO	Liberated	50	5.41%
599	Sulfosalt	Liberated	122	
599	Sulfosalt	Liberated	14	
599	Sulfosalt	Liberated	10	
599	Sulfosalt	Liberated	50	
599	Sulfosalt	Liberated	34	1.55%
599	FeSO4	Liberated	43	
599	FeSO4	Liberated	25	
599	FeSO4	Liberated	88	
599	FeSO4	Liberated	16	
599	FeSO4	Liberated	26	
599	FeSO4	Liberated	27	
599	FeSO4	Liberated	90	
599	FeSO4	Liberated	29	
599	FeSO4	Liberated	42	
599	FeSO4	Liberated	20	
599	FeSO4	Liberated	32	
599	FeSO4	Cemented	75	
599	FeSO4	Liberated	24	
599	FeSO4	Liberated	24	3.78%
599	**TOTAL**		14850	
600	AsMO	Liberated	5	
600	AsMO	Liberated	32	
600	AsMO	Liberated	45	
600	AsMO	Liberated	8	
600	AsMO	Cemented	130	8.88%
600	Cu5FeS4	Liberated	48	
600	Cu5FeS4	Liberated	9	
600	Cu5FeS4	Liberated	8	2.62%
600	CuFeS2	Liberated	90	
600	CuFeS2	Liberated	55	
600	CuFeS2	Liberated	25	
600	CuFeS2	Liberated	8	
600	CuFeS2	Liberated	12	
600	CuFeS2	Liberated	13	
600	CuFeS2	Liberated	75	11.22%
600	Cu2FeS2	Liberated	45	
600	Cu2FeS2	Inclusion	3	
600	Cu2FeS2	Inclusion	3	
600	Cu2FeS2	Inclusion	3	
600	Cu2FeS2	Inclusion	3	
600	Cu2FeS2	Inclusion	3	
600	Cu2FeS2	Liberated	32	
600	Cu2FeS2	Inclusion	2	
600	Cu2FeS2	Inclusion	2	
600	Cu2FeS2	Inclusion	2	
600	Cu2FeS2	Inclusion	2	
600	Cu2FeS2	Liberated	8	
600	Cu2FeS2	Liberated	28	
600	Cu2FeS2	Liberated	88	
600	Cu2FeS2	Rimming	30	
600	Cu2FeS2	Liberated	7	10.54%

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
600	CuFe2S3	Rimming	40	
600	CuFe2S3	Rimming	46	
600	CuFe2S3	Inclusion	10	
600	CuFe2S3	Liberated	47	
600	CuFe2S3	Liberated	90	
600	CuFe2S3	Liberated	47	
600	CuFe2S3	Liberated	120	16.15%
600	FeOOH	Liberated	14	
600	FeOOH	Liberated	80	
600	FeOOH	Liberated	40	
600	FeOOH	Liberated	13	
600	FeOOH	Cemented	33	
600	FeOOH	Liberated	8	
600	FeOOH	Cemented	32	
600	FeOOH	Liberated	23	
600	FeOOH	Liberated	33	
600	FeOOH	Liberated	13	
600	FeOOH	Liberated	8	
600	FeOOH	Liberated	96	
600	FeOOH	Liberated	40	
600	FeOOH	Cemented	80	
600	FeOOH	Rimming	45	
600	FeOOH	Liberated	11	
600	FeOOH	Cemented	85	26.40%
600	FeCuOOH	Liberated	20	
600	FeCuOOH	Liberated	14	
600	FeCuOOH	Liberated	5	
600	FeCuOOH	Liberated	10	
600	FeCuOOH	Liberated	120	6.82%
600	Cu2S	Liberated	35	
600	Cu2S	Liberated	30	
600	Cu2S	Liberated	32	
600	Cu2S	Liberated	30	
600	Cu2S	Liberated	35	
600	Cu2S	Liberated	90	
600	Cu2S	Liberated	50	
600	Cu2S	Liberated	75	
600	Cu2S	Rimming	18	15.95%
600	CuO	Liberated	18	0.73%
600	FeSO4	Liberated	17	0.69%
600	**TOTAL**		2477	
601	CuSO4	Liberated	38	
601	CuSO4	Inclusion	11	
601	CuSO4	Liberated	8	
601	CuSO4	Rimming	48	
601	CuSO4	Inclusion	23	
601	CuSO4	Rimming	45	1.33%
601	AsMO	Cemented	45	
601	AsMO	Liberated	35	
601	AsMO	Liberated	36	
601	AsMO	Inclusion	18	
601	AsMO	Cemented	12	
601	AsMO	Cemented	75	
601	AsMO	Liberated	42	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
601	AsMO	Liberated	55	
601	AsMO	Liberated	100	
601	AsMO	Liberated	15	3.33%
601	Cu5FeS4	Liberated	50	
601	Cu5FeS4	Liberated	60	
601	Cu5FeS4	Rimming	24	
601	Cu5FeS4	Inclusion	45	
601	Cu5FeS4	Liberated	13	
601	Cu5FeS4	Liberated	95	
601	Cu5FeS4	Liberated	28	
601	Cu5FeS4	Liberated	105	
601	Cu5FeS4	Liberated	16	
601	Cu5FeS4	Liberated	34	
601	Cu5FeS4	Liberated	45	
601	Cu5FeS4	Liberated	42	
601	Cu5FeS4	Liberated	30	
601	Cu5FeS4	Liberated	50	
601	Cu5FeS4	Inclusion	38	
601	Cu5FeS4	Liberated	40	
601	Cu5FeS4	Liberated	38	
601	Cu5FeS4	Liberated	48	
601	Cu5FeS4	Liberated	38	
601	Cu5FeS4	Liberated	32	
601	Cu5FeS4	Liberated	38	
601	Cu5FeS4	Rimming	50	
601	Cu5FeS4	Inclusion	38	
601	Cu5FeS4	Liberated	60	
601	Cu5FeS4	Liberated	20	
601	Cu5FeS4	Rimming	17	
601	Cu5FeS4	Liberated	58	
601	Cu5FeS4	Liberated	52	
601	Cu5FeS4	Liberated	50	
601	Cu5FeS4	Liberated	55	
601	Cu5FeS4	Liberated	55	
601	Cu5FeS4	Liberated	90	
601	Cu5FeS4	Liberated	100	11.94%
601	CuFeS2	Liberated	85	
601	CuFeS2	Liberated	22	
601	CuFeS2	Liberated	45	
601	CuFeS2	Liberated	48	
601	CuFeS2	Liberated	95	
601	CuFeS2	Liberated	90	
601	CuFeS2	Liberated	45	
601	CuFeS2	Liberated	48	
601	CuFeS2	Liberated	105	
601	CuFeS2	Liberated	42	
601	CuFeS2	Liberated	38	
601	CuFeS2	Liberated	68	
601	CuFeS2	Liberated	34	
601	CuFeS2	Liberated	50	
601	CuFeS2	Liberated	45	
601	CuFeS2	Liberated	30	
601	CuFeS2	Liberated	18	
601	CuFeS2	Liberated	60	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
601	CuFeS2	Liberated	58	
601	CuFeS2	Liberated	60	
601	CuFeS2	Liberated	85	
601	CuFeS2	Liberated	80	
601	CuFeS2	Liberated	90	
601	CuFeS2	Liberated	85	
601	CuFeS2	Liberated	92	
601	CuFeS2	Liberated	140	
601	CuFeS2	Liberated	55	
601	CuFeS2	Liberated	90	
601	CuFeS2	Liberated	95	
601	CuFeS2	Liberated	60	
601	CuFeS2	Liberated	20	
601	CuFeS2	Liberated	18	
601	CuFeS2	Liberated	50	
601	CuFeS2	Liberated	14	
601	CuFeS2	Liberated	55	16.25%
601	Cu2FeS2	Liberated	30	
601	Cu2FeS2	Liberated	98	
601	Cu2FeS2	Liberated	89	
601	Cu2FeS2	Cemented	28	
601	Cu2FeS2	Rimming	55	
601	Cu2FeS2	Liberated	80	
601	Cu2FeS2	Liberated	90	3.61%
601	CuFe2S3	Liberated	50	
601	CuFe2S3	Liberated	95	
601	CuFe2S3	Cemented	10	
601	CuFe2S3	Cemented	10	
601	CuFe2S3	Cemented	10	
601	CuFe2S3	Cemented	10	
601	CuFe2S3	Liberated	42	
601	CuFe2S3	Liberated	22	
601	CuFe2S3	Liberated	100	
601	CuFe2S3	Liberated	92	
601	CuFe2S3	Cemented	50	
601	CuFe2S3	Liberated	42	
601	CuFe2S3	Liberated	46	
601	CuFe2S3	Liberated	15	
601	CuFe2S3	Liberated	50	
601	CuFe2S3	Liberated	38	
601	CuFe2S3	Liberated	65	
601	CuFe2S3	Liberated	30	
601	CuFe2S3	Liberated	30	
601	CuFe2S3	Liberated	50	
601	CuFe2S3	Liberated	80	
601	CuFe2S3	Liberated	30	
601	CuFe2S3	Liberated	90	
601	CuFe2S3	Liberated	55	
601	CuFe2S3	Liberated	50	
601	CuFe2S3	Inclusion	42	9.25%
601	FeOOH	Rimming	25	
601	FeOOH	Liberated	50	
601	FeOOH	Liberated	110	
601	FeOOH	Liberated	42	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
601	FeOOH	Rimming	35	
601	FeOOH	Liberated	18	
601	FeOOH	Liberated	100	
601	FeOOH	Liberated	11	
601	FeOOH	Liberated	58	
601	FeOOH	Liberated	100	
601	FeOOH	Cemented	45	
601	FeOOH		58	
601	FeOOH	Liberated	35	
601	FeOOH	Liberated	32	
601	FeOOH	Rimming	35	
601	FeOOH	Cemented	28	
601	FeOOH	Liberated	22	
601	FeOOH	Cemented	88	
601	FeOOH	Cemented	28	
601	FeOOH	Rimming	55	
601	FeOOH	Rimming	40	
601	FeOOH	Liberated	78	
601	FeOOH	Liberated	14	
601	FeOOH	Rimming	14	
601	FeOOH	Liberated	22	
601	FeOOH	Cemented	55	
601	FeOOH	Rimming	50	
601	FeOOH	Rimming	15	
601	FeOOH	Rimming	20	9.86%
601	FeCuOOH	Cemented	110	
601	FeCuOOH	Liberated	31	
601	FeCuOOH	Liberated	12	
601	FeCuOOH	Liberated	7	
601	FeCuOOH	Liberated	18	
601	FeCuOOH	Liberated	8	1.43%
601	Cu2S	Liberated	80	
601	Cu2S	Liberated	50	
601	Cu2S	Liberated	50	
601	Cu2S	Liberated	24	
601	Cu2S	Liberated	32	
601	Cu2S	Liberated	85	
601	Cu2S	Liberated	105	
601	Cu2S	Liberated	50	
601	Cu2S	Liberated	32	
601	Cu2S	Liberated	45	
601	Cu2S	Liberated	55	
601	Cu2S	Liberated	55	
601	Cu2S	Liberated	105	
601	Cu2S	Rimming	35	
601	Cu2S	Liberated	24	
601	Cu2S	Liberated	30	
601	Cu2S	Liberated	42	
601	Cu2S	Liberated	36	
601	Cu2S	Liberated	24	
601	Cu2S	Liberated	105	
601	Cu2S	Liberated	36	
601	Cu2S	Rimming	40	
601	Cu2S	Liberated	40	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
601	Cu2S	Liberated	40	
601	Cu2S	Liberated	24	
601	Cu2S	Liberated	36	
601	Cu2S	Liberated	45	
601	Cu2S	Liberated	48	
601	Cu2S	Liberated	96	
601	Cu2S	Liberated	105	
601	Cu2S	Liberated	45	
601	Cu2S	Liberated	40	
601	Cu2S	Liberated	48	
601	Cu2S	Liberated	60	
601	Cu2S	Liberated	40	
601	Cu2S	Liberated	50	
601	Cu2S	Liberated	95	
601	Cu2S	Liberated	65	
601	Cu2S	Liberated	45	
601	Cu2S	Liberated	30	
601	Cu2S	Liberated	13	
601	Cu2S	Liberated	60	
601	Cu2S	Liberated	100	
601	Cu2S	Liberated	36	
601	Cu2S	Liberated	20	
601	Cu2S	Liberated	45	
601	Cu2S	Liberated	14	
601	Cu2S	Liberated	35	
601	Cu2S	Liberated	102	
601	Cu2S	Liberated	50	
601	Cu2S	Liberated	50	
601	Cu2S	Liberated	48	
601	Cu2S	Liberated	48	
601	Cu2S	Liberated	20	
601	Cu2S	Liberated	48	
601	Cu2S	Liberated	50	
601	Cu2S	Liberated	55	
601	Cu2S	Rimming	75	
601	Cu2S	Liberated	46	
601	Cu2S	Liberated	58	
601	Cu2S	Liberated	65	
601	Cu2S	Liberated	35	
601	Cu2S	Liberated	55	
601	Cu2S	Liberated	30	
601	Cu2S	Liberated	28	
601	Cu2S	Rimming	18	
601	Cu2S	Liberated	60	
601	Cu2S	Liberated	55	
601	Cu2S	Liberated	55	
601	Cu2S	Liberated	100	
601	Cu2S	Rimming	19	
601	Cu2S	Liberated	90	28.24%
601	Native Copper	Inclusion	31	
601	Native Copper	Inclusion	18	
601	Native Copper	Liberated	100	
601	Native Copper	Inclusion	24	
601	Native Copper	Rimming	24	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
601	Native Copper	Inclusion	15	
601	Native Copper	Inclusion	11	
601	Native Copper	Liberated	58	
601	Native Copper	Liberated	20	
601	Native Copper	Inclusion	11	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	2	
601	Native Copper	Inclusion	20	
601	Native Copper	Inclusion	48	
601	Native Copper	Liberated	50	
601	Native Copper	Cemented	55	4.22%
601	CuO	Liberated	90	
601	CuO	Liberated	30	
601	CuO	Liberated	45	
601	CuO	Liberated	45	
601	CuO	Inclusion	24	
601	CuO	Inclusion	24	
601	CuO	Liberated	48	
601	CuO	Inclusion	14	
601	CuO	Liberated	42	
601	CuO	Liberated	23	
601	CuO	Liberated	50	
601	CuO	Rimming	42	
601	CuO	Liberated	24	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
601	CuO	Inclusion	16	
601	CuO	Liberated	21	
601	CuO	Inclusion	40	
601	CuO	Rimming	30	
601	CuO	Liberated	50	
601	CuO	Inclusion	21	
601	CuO	Liberated	3	
601	CuO	Liberated	48	
601	CuO	Liberated	20	
601	CuO	Liberated	41	
601	CuO	Inclusion	28	
601	CuO	Inclusion	30	
601	CuO	Inclusion	26	
601	CuO	Inclusion	20	
601	CuO	Liberated	48	
601	CuO	Inclusion	25	7.44%
601	FeSO4	Liberated	95	
601	FeSO4	Liberated	110	
601	FeSO4	Liberated	38	
601	FeSO4	Cemented	45	
601	FeSO4	Rimming	26	
601	FeSO4	Liberated	60	
601	FeSO4	Inclusion	30	3.10%
601	**TOTAL**		13014	
602	CuSO4	Liberated	30	0.39%
602	AsMO	Cemented	48	
602	AsMO	Liberated	26	
602	AsMO	Liberated	110	
602	AsMO	Liberated	120	
602	AsMO	Liberated	20	
602	AsMO	Liberated	85	5.33%
602	Cu5FeS4	Liberated	35	
602	Cu5FeS4	Liberated	4	
602	Cu5FeS4	Liberated	18	
602	Cu5FeS4	Liberated	50	
602	Cu5FeS4	Liberated	95	
602	Cu5FeS4	Rimming	70	
602	Cu5FeS4	Inclusion	30	
602	Cu5FeS4	Liberated	85	
602	Cu5FeS4	Liberated	90	
602	Cu5FeS4	Liberated	5	
602	Cu5FeS4	Liberated	23	
602	Cu5FeS4	Liberated	82	
602	Cu5FeS4	Rimming	35	
602	Cu5FeS4	Inclusion	12	
602	Cu5FeS4	Liberated	85	9.37%
602	Brass	Rimming	100	1.30%
602	CuFeS2	Liberated	40	
602	CuFeS2	Liberated	70	
602	CuFeS2	Liberated	85	
602	CuFeS2	Liberated	90	
602	CuFeS2	Liberated	28	
602	CuFeS2	Liberated	48	
602	CuFeS2	Liberated	130	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
602	CuFeS2	Liberated	36	
602	CuFeS2	Liberated	60	
602	CuFeS2	Liberated	48	
602	CuFeS2	Liberated	32	
602	CuFeS2	Liberated	86	
602	CuFeS2	Liberated	90	
602	CuFeS2	Liberated	85	
602	CuFeS2	Liberated	28	12.46%
602	Cu2FeS2	Liberated	50	
602	Cu2FeS2	Liberated	9	
602	Cu2FeS2	Inclusion	28	
602	Cu2FeS2	Inclusion	5	
602	Cu2FeS2	Inclusion	5	
602	Cu2FeS2	Liberated	85	
602	Cu2FeS2	Liberated	40	
602	Cu2FeS2	Rimming	88	
602	Cu2FeS2	Inclusion	9	
602	Cu2FeS2	Inclusion	3	
602	Cu2FeS2	Inclusion	1	
602	Cu2FeS2	Inclusion	1	
602	Cu2FeS2	Inclusion	1	
602	Cu2FeS2	Inclusion	1	
602	Cu2FeS2	Inclusion	1	
602	Cu2FeS2	Liberated	80	
602	Cu2FeS2	Liberated	50	5.96%
602	CuFe2S3	Liberated	48	
602	CuFe2S3	Liberated	80	
602	CuFe2S3	Liberated	90	
602	CuFe2S3	Liberated	100	
602	CuFe2S3	Liberated	60	
602	CuFe2S3	Rimming	32	
602	CuFe2S3	Liberated	90	
602	CuFe2S3	Liberated	110	
602	CuFe2S3	Liberated	85	
602	CuFe2S3	Liberated	48	9.68%
602	CuMO	Inclusion	7	
602	CuMO	Inclusion	6	
602	CuMO	Inclusion	1	
602	CuMO	Inclusion	1	
602	CuMO	Inclusion	1	
602	CuMO	Inclusion	1	
602	CuMO	Inclusion	1	
602	CuMO	Inclusion	1	
602	CuMO	Inclusion	1	0.26%
602	FeOOH	Liberated	12	
602	FeOOH	Liberated	30	
602	FeOOH	Liberated	52	
602	FeOOH	Liberated	105	
602	FeOOH	Cemented	26	
602	FeOOH	Cemented	87	
602	FeOOH	Liberated	38	
602	FeOOH	Cemented	135	
602	FeOOH	Liberated	60	
602	FeOOH	Cemented	7	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
602	FeOOH	Cemented	9	
602	FeOOH	Liberated	75	
602	FeOOH	Liberated	26	
602	FeOOH	Rimming	120	
602	FeOOH	Liberated	18	
602	FeOOH	Liberated	65	
602	FeOOH	Cemented	82	
602	FeOOH	Liberated	90	
602	FeOOH	Liberated	86	
602	FeOOH	Cemented	115	
602	FeOOH	Liberated	45	
602	FeOOH	Rimming	60	
602	FeOOH	Liberated	130	
602	FeOOH	Rimming	75	
602	FeOOH	Liberated	90	
602	FeOOH	Cemented	90	
602	FeOOH	Liberated	50	
602	FeOOH	Cemented	48	23.79%
602	FeCuOOH	Liberated	90	
602	FeCuOOH	Liberated	55	
602	FeCuOOH	Liberated	55	2.61%
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Cemented	1	
602	Cu2S	Liberated	27	
602	Cu2S	Liberated	105	
602	Cu2S	Liberated	55	
602	Cu2S	Liberated	55	
602	Cu2S	Liberated	85	
602	Cu2S	Liberated	15	
602	Cu2S	Liberated	38	
602	Cu2S	Liberated	85	
602	Cu2S	Liberated	15	
602	Cu2S	Liberated	40	

Golder Associates

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
602	Cu2S	Liberated	90	
602	Cu2S	Liberated	22	
602	Cu2S	Liberated	50	
602	Cu2S	Liberated	92	
602	Cu2S	Liberated	45	
602	Cu2S	Liberated	60	
602	Cu2S	Inclusion	35	
602	Cu2S	Liberated	11	
602	Cu2S	Liberated	85	
602	Cu2S	Liberated	24	
602	Cu2S	Liberated	97	
602	Cu2S	Liberated	70	
602	Cu2S	Liberated	100	
602	Cu2S	Liberated	90	
602	Cu2S	Liberated	105	
602	Cu2S	Liberated	30	
602	Cu2S	Liberated	80	
602	Cu2S	Liberated	86	22.35%
602	Native Copper	Liberated	100	1.30%
602	CuO	Liberated	32	
602	CuO	Liberated	45	
602	CuO	Liberated	40	
602	CuO	Liberated	31	
602	CuO	Liberated	58	
602	CuO	Liberated	45	
602	CuO	Liberated	36	3.74%
602	FeSO4	Liberated	12	
602	FeSO4	Liberated	9	
602	FeSO4	Liberated	20	
602	FeSO4	Liberated	29	
602	FeSO4	Liberated	42	1.46%
602	**TOTAL**		7674	
603	CuSO4	Rimming	20	
603	CuSO4	Rimming	35	
603	CuSO4	Liberated	85	
603	CuSO4	Liberated	20	
603	CuSO4	Liberated	29	
603	CuSO4	Rimming	22	
603	CuSO4	Liberated	13	
603	CuSO4	Liberated	48	
603	CuSO4	Liberated	40	
603	CuSO4	Liberated	45	2.81%
603	AsMO	Liberated	12	
603	AsMO	Liberated	8	
603	AsMO	Liberated	14	
603	AsMO	Liberated	15	
603	AsMO	Liberated	21	
603	AsMO	Liberated	9	
603	AsMO	Cemented	60	
603	AsMO	Liberated	11	
603	AsMO	Liberated	30	
603	AsMO	Cemented	34	
603	AsMO	Cemented	28	
603	AsMO	Liberated	100	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
603	AsMO	Liberated	125	3.68%
603	Cu5FeS4	Liberated	92	
603	Cu5FeS4	Liberated	47	
603	Cu5FeS4	Liberated	50	
603	Cu5FeS4	Liberated	70	
603	Cu5FeS4	Liberated	45	
603	Cu5FeS4	Liberated	35	
603	Cu5FeS4	Rimming	45	
603	Cu5FeS4	Liberated	55	
603	Cu5FeS4	Liberated	48	
603	Cu5FeS4	Liberated	85	
603	Cu5FeS4	Liberated	55	
603	Cu5FeS4	Liberated	78	
603	Cu5FeS4	Liberated	78	
603	Cu5FeS4	Liberated	50	
603	Cu5FeS4	Liberated	22	
603	Cu5FeS4	Inclusion	10	
603	Cu5FeS4	Rimming	50	
603	Cu5FeS4	Liberated	22	
603	Cu5FeS4	Liberated	36	
603	Cu5FeS4	Liberated	20	
603	Cu5FeS4	Liberated	125	
603	Cu5FeS4	Liberated	55	
603	Cu5FeS4	Liberated	90	9.95%
603	CuFeS2	Liberated	105	
603	CuFeS2	Liberated	9	
603	CuFeS2	Liberated	46	
603	CuFeS2	Liberated	32	
603	CuFeS2	Liberated	55	
603	CuFeS2	Liberated	18	
603	CuFeS2	Liberated	65	
603	CuFeS2	Liberated	38	
603	CuFeS2		45	
603	CuFeS2	Liberated	90	
603	CuFeS2	Liberated	11	
603	CuFeS2	Liberated	36	
603	CuFeS2	Liberated	20	
603	CuFeS2	Liberated	48	
603	CuFeS2	Liberated	95	
603	CuFeS2	Liberated	42	
603	CuFeS2	Liberated	45	
603	CuFeS2	Liberated	90	
603	CuFeS2	Liberated	60	
603	CuFeS2	Liberated	30	
603	CuFeS2	Liberated	90	
603	CuFeS2	Liberated	18	
603	CuFeS2	Liberated	17	
603	CuFeS2	Liberated	14	
603	CuFeS2	Liberated	30	
603	CuFeS2	Liberated	50	
603	CuFeS2	Liberated	50	
603	CuFeS2	Liberated	52	
603	CuFeS2	Liberated	36	
603	CuFeS2	Liberated	18	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
603	CuFeS2	Liberated	15	
603	CuFeS2	Liberated	90	
603	CuFeS2	Rimming	40	
603	CuFeS2	Liberated	55	
603	CuFeS2	Liberated	25	
603	CuFeS2	Liberated	50	
603	CuFeS2	Liberated	22	
603	CuFeS2	Rimming	50	
603	CuFeS2	Liberated	12	
603	CuFeS2	Liberated	55	
603	CuFeS2	Liberated	26	
603	CuFeS2	Liberated	20	
603	CuFeS2	Liberated	80	
603	CuFeS2	Liberated	35	
603	CuFeS2	Liberated	95	
603	CuFeS2	Liberated	41	
603	CuFeS2	Liberated	30	16.51%
603	Cu2FeS2	Rimming	10	
603	Cu2FeS2	Liberated	48	
603	Cu2FeS2	Liberated	96	
603	Cu2FeS2	Liberated	38	
603	Cu2FeS2	Inclusion	13	
603	Cu2FeS2	Inclusion	5	
603	Cu2FeS2	Liberated	85	
603	Cu2FeS2	Liberated	60	
603	Cu2FeS2	Liberated	15	
603	Cu2FeS2	Liberated	60	
603	Cu2FeS2	Liberated	35	
603	Cu2FeS2	Liberated	32	
603	Cu2FeS2	Liberated	8	
603	Cu2FeS2	Liberated	78	
603	Cu2FeS2	Liberated	46	
603	Cu2FeS2	Liberated	85	
603	Cu2FeS2	Liberated	35	
603	Cu2FeS2	Liberated	55	
603	Cu2FeS2	Liberated	36	6.61%
603	CuFe2S3	Liberated	92	
603	CuFe2S3	Liberated	32	
603	CuFe2S3	Liberated	30	
603	CuFe2S3	Liberated	37	
603	CuFe2S3	Liberated	35	
603	CuFe2S3	Inclusion	28	
603	CuFe2S3	Liberated	40	
603	CuFe2S3	Liberated	45	
603	CuFe2S3	Rimming	78	
603	CuFe2S3	Rimming	60	
603	CuFe2S3	Liberated	40	
603	CuFe2S3	Inclusion	12	
603	CuFe2S3	Inclusion	4	
603	CuFe2S3	Liberated	20	
603	CuFe2S3	Liberated	25	
603	CuFe2S3	Rimming	48	
603	CuFe2S3	Liberated	35	
603	CuFe2S3	Liberated	75	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
603	CuFe2S3	Liberated	65	
603	CuFe2S3	Liberated	92	
603	CuFe2S3	Inclusion	10	
603	CuFe2S3	Inclusion	10	
603	CuFe2S3	Inclusion	10	
603	CuFe2S3	Inclusion	10	
603	CuFe2S3	Liberated	65	7.86%
603	FeOOH	Rimming	18	
603	FeOOH	Liberated	5	
603	FeOOH	Liberated	125	
603	FeOOH	Liberated	8	
603	FeOOH	Liberated	8	
603	FeOOH	Rimming	20	
603	FeOOH	Liberated	11	
603	FeOOH	Liberated	95	
603	FeOOH	Liberated	11	
603	FeOOH	Liberated	40	
603	FeOOH	Liberated	32	
603	FeOOH	Rimming	40	
603	FeOOH	Liberated	55	
603	FeOOH	Liberated	60	
603	FeOOH	Liberated	75	
603	FeOOH	Liberated	90	
603	FeOOH	Liberated	28	
603	FeOOH	Liberated	40	
603	FeOOH	Liberated	25	
603	FeOOH	Liberated	96	
603	FeOOH	Liberated	60	
603	FeOOH	Cemented	28	
603	FeOOH	Cemented	46	
603	FeOOH	Liberated	50	
603	FeOOH	Liberated	42	
603	FeOOH	Liberated	20	
603	FeOOH	Rimming	25	
603	FeOOH	Rimming	26	
603	FeOOH	Liberated	85	
603	FeOOH	Liberated	20	
603	FeOOH	Rimming	50	
603	FeOOH	Liberated	21	
603	FeOOH	Rimming	50	
603	FeOOH	Rimming	18	
603	FeOOH	Rimming	25	
603	FeOOH	Liberated	95	
603	FeOOH	Liberated	50	
603	FeOOH	Liberated	100	
603	FeOOH	Liberated	128	
603	FeOOH	Liberated	80	
603	FeOOH	Liberated	19	
603	FeOOH	Liberated	60	
603	FeOOH	Liberated	60	
603	FeOOH	Rimming	25	
603	FeOOH	Liberated	25	
603	FeOOH	Liberated	90	17.17%
603	FeCuOOH	Liberated	12	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
603	FeCuOOH	Liberated	26	
603	FeCuOOH	Liberated	8	
603	FeCuOOH	Liberated	12	
603	FeCuOOH	Liberated	20	
603	FeCuOOH	Liberated	150	
603	FeCuOOH	Liberated	50	2.19%
603	Cu2S	Liberated	48	
603	Cu2S	Liberated	52	
603	Cu2S	Liberated	80	
603	Cu2S	Liberated	90	
603	Cu2S	Inclusion	10	
603	Cu2S	Inclusion	10	
603	Cu2S	Liberated	86	
603	Cu2S	Liberated	60	
603	Cu2S	Liberated	55	
603	Cu2S	Liberated	88	
603	Cu2S	Liberated	85	
603	Cu2S	Liberated	100	
603	Cu2S	Liberated	60	
603	Cu2S	Liberated	85	
603	Cu2S	Liberated	50	
603	Cu2S		50	
603	Cu2S	Liberated	85	
603	Cu2S	Liberated	85	
603	Cu2S	Liberated	90	
603	Cu2S	Liberated	95	
603	Cu2S	Liberated	108	
603	Cu2S	Liberated	36	
603	Cu2S	Liberated	50	
603	Cu2S	Liberated	48	
603	Cu2S	Liberated	100	
603	Cu2S	Liberated	45	
603	Cu2S	Rimming	32	
603	Cu2S	Liberated	35	
603	Cu2S	Liberated	38	
603	Cu2S	Inclusion	12	
603	Cu2S	Liberated	23	
603	Cu2S	Liberated	88	
603	Cu2S	Liberated	42	
603	Cu2S	Liberated	19	
603	Cu2S	Liberated	38	
603	Cu2S	Liberated	48	
603	Cu2S	Liberated	85	
603	Cu2S	Liberated	60	17.88%
603	Native Copper	Inclusion	48	
603	Native Copper	Inclusion	8	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	38	
603	Native Copper	Inclusion	9	
603	Native Copper	Inclusion	13	
603	Native Copper	Inclusion	32	
603	Native Copper	Inclusion	4	
603	Native Copper	Inclusion	4	
603	Native Copper	Inclusion	4	
603	Native Copper	Inclusion	4	
603	Native Copper	Inclusion	4	
603	Native Copper	Inclusion	4	
603	Native Copper	Inclusion	52	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	1	
603	Native Copper	Inclusion	14	
603	Native Copper	Inclusion	32	
603	Native Copper	Inclusion	8	2.35%
603	CuO	Liberated	80	
603	CuO	Liberated	38	
603	CuO	Liberated	35	
603	CuO	Inclusion	30	
603	CuO	Inclusion	26	
603	CuO	Inclusion	20	
603	CuO	Liberated	45	
603	CuO	Inclusion	18	
603	CuO	Liberated	40	
603	CuO	Inclusion	28	
603	CuO	Liberated	45	
603	CuO	Liberated	63	
603	CuO	Inclusion	25	
603	CuO	Liberated	17	
603	CuO	Liberated	19	
603	CuO	Inclusion	38	
603	CuO	Liberated	13	
603	CuO	Liberated	20	
603	CuO	Liberated	40	
603	CuO	Liberated	38	
603	CuO	Liberated	45	
603	CuO	Inclusion	28	
603	CuO	Liberated	26	
603	CuO	Liberated	75	6.71%
603	Slag	Liberated	130	
603	Slag	Liberated	175	2.40%
603	FeSO4	Liberated	85	
603	FeSO4	Rimming	8	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
603	FeSO4	Liberated	26	
603	FeSO4	Liberated	45	
603	FeSO4	Liberated	62	
603	FeSO4	Liberated	33	
603	FeSO4	Liberated	88	
603	FeSO4	Cemented	32	
603	FeSO4	Liberated	55	
603	FeSO4	Liberated	60	3.89%
603	**TOTAL**		12699	
604	AsMO	Liberated	26	1.79%
604	Cu5FeS4	Liberated	30	
604	Cu5FeS4	Liberated	90	
604	Cu5FeS4	Liberated	45	
604	Cu5FeS4	Liberated	58	15.32%
604	CuFeS2	Liberated	12	
604	CuFeS2	Liberated	50	
604	CuFeS2	Liberated	85	
604	CuFeS2	Liberated	90	
604	CuFeS2	Liberated	20	17.65%
604	CuFe2S3	Liberated	22	
604	CuFe2S3	Liberated	89	
604	CuFe2S3	Liberated	35	
604	CuFe2S3	Liberated	105	17.24%
604	FeOOH	Liberated	28	
604	FeOOH	Liberated	8	
604	FeOOH	Liberated	80	
604	FeOOH	Liberated	12	
604	FeOOH	Rimming	30	
604	FeOOH	Rimming	20	
604	FeOOH	Rimming	20	
604	FeOOH	Cemented	14	
604	FeOOH	Rimming	30	
604	FeOOH	Liberated	80	
604	FeOOH	Liberated	200	35.85%
604	FeCuOOH	Liberated	82	5.63%
604	Cu2S	Liberated	20	
604	Cu2S	Inclusion	10	
604	Cu2S	Inclusion	5	
604	Cu2S	Inclusion	5	2.75%
604	FeSO4	Liberated	55	3.78%
604	**TOTAL**		1456	
605	CuSO4	Liberated	75	
605	CuSO4	Rimming	40	
605	CuSO4	Liberated	65	
605	CuSO4	Liberated	36	
605	CuSO4	Rimming	19	
605	CuSO4	Liberated	40	
605	CuSO4	Liberated	50	
605	CuSO4	Liberated	43	
605	CuSO4	Rimming	18	
605	CuSO4	Liberated	30	
605	CuSO4	Liberated	20	
605	CuSO4	Liberated	16	4.74%
605	AsMO	Liberated	12	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
605	AsMO	Liberated	10	
605	AsMO	Liberated	14	
605	AsMO	Liberated	26	
605	AsMO	Cemented	41	
605	AsMO	Cemented	52	
605	AsMO	Cemented	9	
605	AsMO	Cemented	50	
605	AsMO	Liberated	9	
605	AsMO	Cemented	7	
605	AsMO	Cemented	48	
605	AsMO	Cemented	36	
605	AsMO	Liberated	12	
605	AsMO	Liberated	12	
605	AsMO	Liberated	12	
605	AsMO	Cemented	46	
605	AsMO	Liberated	16	
605	AsMO	Liberated	32	
605	AsMO	Liberated	10	
605	AsMO	Liberated	10	
605	AsMO	Liberated	10	
605	AsMO	Liberated	10	
605	AsMO	Cemented	82	
605	AsMO	Liberated	28	6.23%
605	Cu5FeS4	Liberated	50	
605	Cu5FeS4	Inclusion	48	
605	Cu5FeS4	Liberated	40	
605	Cu5FeS4	Liberated	20	
605	Cu5FeS4	Liberated	60	
605	Cu5FeS4	Liberated	48	
605	Cu5FeS4	Liberated	40	
605	Cu5FeS4	Liberated	85	
605	Cu5FeS4	Rimming	85	
605	Cu5FeS4	Liberated	48	
605	Cu5FeS4	Liberated	50	
605	Cu5FeS4	Liberated	95	
605	Cu5FeS4	Liberated	48	
605	Cu5FeS4	Liberated	52	
605	Cu5FeS4	Liberated	45	
605	Cu5FeS4	Liberated	16	8.71%
605	CuFeS2	Liberated	40	
605	CuFeS2	Liberated	26	
605	CuFeS2	Liberated	55	
605	CuFeS2	Liberated	48	
605	CuFeS2	Liberated	105	
605	CuFeS2	Liberated	30	
605	CuFeS2	Liberated	30	
605	CuFeS2	Liberated	32	
605	CuFeS2	Liberated	35	
605	CuFeS2	Liberated	13	
605	CuFeS2	Cemented	92	
605	CuFeS2	Liberated	55	
605	CuFeS2	Liberated	50	
605	CuFeS2	Liberated	32	
605	CuFeS2	Cemented	50	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
605	CuFeS2	Liberated	28	
605	CuFeS2	Liberated	16	
605	CuFeS2	Liberated	50	
605	CuFeS2	Liberated	31	
605	CuFeS2	Liberated	58	
605	CuFeS2	Liberated	50	
605	CuFeS2	Liberated	65	
605	CuFeS2	Liberated	40	
605	CuFeS2	Liberated	35	
605	CuFeS2	Liberated	120	
605	CuFeS2	Liberated	35	
605	CuFeS2	Liberated	36	
605	CuFeS2	Liberated	115	14.40%
605	Cu2FeS2	Liberated	50	
605	Cu2FeS2	Liberated	28	
605	Cu2FeS2	Inclusion	22	
605	Cu2FeS2	Inclusion	22	
605	Cu2FeS2	Liberated	40	
605	Cu2FeS2	Liberated	90	
605	Cu2FeS2	Liberated	52	
605	Cu2FeS2	Inclusion	14	
605	Cu2FeS2	Inclusion	4	3.38%
605	CuFe2S3	Liberated	17	
605	CuFe2S3	Liberated	18	
605	CuFe2S3	Liberated	18	
605	CuFe2S3	Liberated	38	
605	CuFe2S3	Liberated	30	
605	CuFe2S3	Liberated	60	
605	CuFe2S3	Liberated	35	
605	CuFe2S3	Liberated	25	
605	CuFe2S3	Liberated	50	
605	CuFe2S3	Liberated	37	
605	CuFe2S3	Liberated	60	
605	CuFe2S3	Rimming	50	
605	CuFe2S3	Liberated	90	5.54%
605	FeOOH	Rimming	20	
605	FeOOH	Liberated	55	
605	FeOOH	Liberated	20	
605	FeOOH	Cemented	46	
605	FeOOH	Cemented	23	
605	FeOOH	Cemented	26	
605	FeOOH	Liberated	12	
605	FeOOH	Liberated	8	
605	FeOOH	Cemented	20	
605	FeOOH	Liberated	9	
605	FeOOH	Liberated	23	
605	FeOOH	Liberated	95	
605	FeOOH	Liberated	12	
605	FeOOH	Liberated	8	
605	FeOOH	Liberated	8	
605	FeOOH	Liberated	8	
605	FeOOH	Liberated	8	
605	FeOOH	Liberated	8	
605	FeOOH	Liberated	8	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
605	FeOOH	Cemented	92	
605	FeOOH	Liberated	8	
605	FeOOH	Liberated	25	
605	FeOOH	Liberated	14	
605	FeOOH	Liberated	10	
605	FeOOH	Rimming	40	
605	FeOOH	Liberated	55	
605	FeOOH	Cemented	92	
605	FeOOH	Liberated	37	
605	FeOOH	Liberated	100	
605	FeOOH	Liberated	105	
605	FeOOH	Rimming	12	
605	FeOOH	Liberated	47	
605	FeOOH	Rimming	20	
605	FeOOH	Rimming	11	
605	FeOOH	Liberated	80	
605	FeOOH	Rimming	45	
605	FeOOH	Rimming	14	
605	FeOOH	Liberated	8	
605	FeOOH	Liberated	40	13.35%
605	FeCuOOH	Cemented	11	
605	FeCuOOH	Liberated	12	
605	FeCuOOH	Cemented	85	
605	FeCuOOH	Liberated	11	1.25%
605	Cu2S	Liberated	50	
605	Cu2S	Liberated	65	
605	Cu2S	Liberated	80	
605	Cu2S	Liberated	35	
605	Cu2S	Liberated	60	
605	Cu2S	Liberated	70	
605	Cu2S	Liberated	30	
605	Cu2S	Liberated	50	
605	Cu2S	Liberated	20	
605	Cu2S	Liberated	12	
605	Cu2S	Liberated	35	
605	Cu2S	Liberated	85	
605	Cu2S	Liberated	85	
605	Cu2S	Liberated	50	
605	Cu2S	Liberated	32	
605	Cu2S	Inclusion	60	
605	Cu2S	Rimming	20	
605	Cu2S	Liberated	48	
605	Cu2S	Liberated	48	
605	Cu2S	Liberated	47	
605	Cu2S	Liberated	36	
605	Cu2S	Liberated	30	
605	Cu2S	Liberated	42	
605	Cu2S	Liberated	40	
605	Cu2S	Liberated	42	
605	Cu2S	Liberated	75	
605	Cu2S	Liberated	50	
605	Cu2S	Liberated	90	
605	Cu2S	Rimming	40	
605	Cu2S	Rimming	28	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
605	Cu2S	Rimming	55	
605	Cu2S	Rimming	11	
605	Cu2S	Liberated	52	
605	Cu2S	Liberated	60	
605	Cu2S	Liberated	32	
605	Cu2S	Inclusion	15	
605	Cu2S	Liberated	18	
605	Cu2S	Liberated	60	
605	Cu2S	Liberated	55	
605	Cu2S	Rimming	15	
605	Cu2S	Liberated	40	
605	Cu2S	Liberated	90	
605	Cu2S	Liberated	50	
605	Cu2S	Liberated	82	
605	Cu2S	Liberated	60	
605	Cu2S	Liberated	58	
605	Cu2S	Liberated	48	
605	Cu2S	Liberated	27	
605	Cu2S	Liberated	58	24.57%
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	26	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	2	
605	Native Copper	Inclusion	30	
605	Native Copper	Inclusion	32	
605	Native Copper	Liberated	55	
605	Native Copper	Inclusion	1	
605	Native Copper	Inclusion	1	
605	Native Copper	Inclusion	1	
605	Native Copper	Inclusion	1	
605	Native Copper	Inclusion	1	
605	Native Copper	Inclusion	1	
605	Native Copper	Inclusion	1	
605	Native Copper	Inclusion	1	
605	Native Copper	Inclusion	1	
605	Native Copper	Inclusion	1	
605	Native Copper	Inclusion	1	
605	Native Copper	Liberated	51	2.47%
605	CuO	Liberated	45	
605	CuO	Liberated	19	
605	CuO	Liberated	36	
605	CuO	Inclusion	25	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
605	CuO	Inclusion	30	
605	CuO	Liberated	38	
605	CuO	Liberated	42	
605	CuO	Liberated	58	
605	CuO	Liberated	25	
605	CuO	Rimming	12	
605	CuO	Inclusion	32	
605	CuO	Inclusion	24	
605	CuO	Liberated	52	
605	CuO	Liberated	58	
605	CuO	Liberated	45	
605	CuO	Inclusion	22	
605	CuO	Rimming	21	
605	CuO	Rimming	45	
605	CuO	Liberated	38	
605	CuO	Inclusion	22	
605	CuO	Liberated	32	
605	CuO	Liberated	42	
605	CuO	Liberated	45	
605	CuO	Liberated	14	8.63%
605	FeSO4	Liberated	8	
605	FeSO4	Liberated	125	
605	FeSO4	Liberated	90	
605	FeSO4	Liberated	100	
605	FeSO4	Liberated	40	
605	FeSO4	Liberated	50	
605	FeSO4	Liberated	32	
605	FeSO4	Liberated	28	
605	FeSO4	Liberated	18	
605	FeSO4	Liberated	150	6.73%
605	**TOTAL**		9528	
606	CuSO4	Liberated	12	
606	CuSO4	Liberated	38	
606	CuSO4	Liberated	48	
606	CuSO4	Liberated	48	2.82%
606	AsMO	Cemented	10	
606	AsMO	Cemented	10	
606	AsMO	Liberated	8	
606	AsMO	Liberated	10	
606	AsMO	Liberated	14	
606	AsMO	Liberated	18	
606	AsMO	Cemented	85	
606	AsMO	Liberated	80	
606	AsMO	Cemented	12	
606	AsMO	Cemented	2	
606	AsMO	Cemented	28	
606	AsMO	Liberated	88	
606	AsMO	Cemented	70	
606	AsMO	Cemented	25	
606	AsMO	Cemented	20	
606	AsMO	Cemented	20	9.64%
606	Cu5FeS4	Liberated	9	
606	Cu5FeS4	Liberated	7	
606	Cu5FeS4	Liberated	90	2.04%

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
606	CaAsO	Liberated	12	0.23%
606	CuFeS2	Liberated	7	
606	CuFeS2	Liberated	12	
606	CuFeS2	Liberated	32	
606	CuFeS2	Liberated	37	
606	CuFeS2	Liberated	50	
606	CuFeS2	Liberated	90	
606	CuFeS2	Liberated	6	
606	CuFeS2	Liberated	95	
606	CuFeS2	Liberated	80	
606	CuFeS2	Liberated	11	
606	CuFeS2	Liberated	85	
606	CuFeS2	Liberated	50	
606	CuFeS2	Liberated	85	
606	CuFeS2	Liberated	22	
606	CuFeS2	Liberated	8	12.92%
606	Cu2FeS2	Rimming	8	
606	Cu2FeS2	Cemented	8	
606	Cu2FeS2	Liberated	3	
606	Cu2FeS2	Liberated	50	1.33%
606	CuFe2S3	Liberated	9	
606	CuFe2S3	Liberated	30	
606	CuFe2S3	Liberated	24	
606	CuFe2S3	Liberated	42	
606	CuFe2S3	Inclusion	40	
606	CuFe2S3	Inclusion	2	
606	CuFe2S3	Inclusion	2	
606	CuFe2S3	Inclusion	2	
606	CuFe2S3	Inclusion	2	
606	CuFe2S3	Inclusion	2	
606	CuFe2S3	Inclusion	2	
606	CuFe2S3	Inclusion	2	
606	CuFe2S3	Inclusion	2	
606	CuFe2S3	Liberated	55	
606	CuFe2S3	Liberated	22	
606	CuFe2S3	Liberated	98	
606	CuFe2S3	Liberated	85	
606	CuFe2S3	Liberated	48	
606	CuFe2S3	Liberated	13	9.29%
606	FeOOH	Liberated	32	
606	FeOOH	Liberated	11	
606	FeOOH	Liberated	8	
606	FeOOH	Liberated	8	
606	FeOOH	Liberated	22	
606	FeOOH	Liberated	7	
606	FeOOH	Liberated	12	
606	FeOOH	Liberated	33	
606	FeOOH	Liberated	25	
606	FeOOH	Liberated	50	
606	FeOOH	Liberated	21	
606	FeOOH	Liberated	128	
606	FeOOH	Cemented	30	
606	FeOOH	Liberated	14	
606	FeOOH	Liberated	12	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
606	FeOOH	Liberated	7	
606	FeOOH	Liberated	4	
606	FeOOH	Liberated	24	
606	FeOOH	Cemented	11	
606	FeOOH	Cemented	14	
606	FeOOH	Liberated	12	
606	FeOOH	Liberated	80	
606	FeOOH	Liberated	15	
606	FeOOH	Liberated	35	
606	FeOOH	Cemented	55	
606	FeOOH	Rimming	55	
606	FeOOH	Cemented	28	
606	FeOOH	Cemented	88	
606	FeOOH	Cemented	14	
606	FeOOH	Cemented	22	
606	FeOOH	Cemented	16	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	48	
606	FeOOH	Cemented	17	
606	FeOOH	Cemented	15	
606	FeOOH	Cemented	27	
606	FeOOH	Liberated	40	
606	FeOOH	Liberated	14	
606	FeOOH	Liberated	58	
606	FeOOH	Cemented	36	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Cemented	8	
606	FeOOH	Liberated	21	
606	FeOOH	Cemented	108	
606	FeOOH	Liberated	48	33.42%
606	FeCuOOH	Cemented	20	
606	FeCuOOH	Liberated	30	
606	FeCuOOH	Liberated	6	
606	FeCuOOH	Liberated	10	
606	FeCuOOH	Liberated	35	
606	FeCuOOH	Liberated	55	
606	FeCuOOH	Liberated	20	3.39%
606	Cu2S	Liberated	95	
606	Cu2S	Liberated	60	
606	Cu2S	Liberated	60	
606	Cu2S	Liberated	42	
606	Cu2S	Liberated	45	
606	Cu2S	Liberated	11	
606	Cu2S	Liberated	50	
606	Cu2S	Liberated	28	
606	Cu2S	Liberated	60	
606	Cu2S	Liberated	32	
606	Cu2S	Rimming	13	
606	Cu2S	Liberated	45	
606	Cu2S	Liberated	47	
606	Cu2S	Liberated	34	
606	Cu2S	Liberated	30	
606	Cu2S	Liberated	65	13.83%
606	CuO	Liberated	9	
606	CuO	Liberated	40	
606	CuO	Liberated	23	
606	CuO	Liberated	12	
606	CuO	Liberated	25	
606	CuO	Liberated	35	
606	CuO	Liberated	32	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
606	CuO	Liberated	21	
606	CuO	Rimming	21	
606	CuO	Liberated	24	
606	CuO	Inclusion	20	5.05%
606	Slag	Liberated	45	0.87%
606	FeSO4	Rimming	16	
606	FeSO4	Liberated	30	
606	FeSO4	Liberated	12	
606	FeSO4	Rimming	40	
606	FeSO4	Liberated	90	
606	FeSO4	Liberated	80	5.17%
606	**TOTAL**		5186	
607	AsMO	Liberated	32	
607	AsMO	Liberated	26	
607	AsMO	Liberated	40	
607	AsMO	Liberated	29	
607	AsMO	Liberated	125	
607	AsMO	Liberated	12	
607	AsMO	Liberated	80	
607	AsMO	Liberated	85	
607	AsMO	Cemented	78	
607	AsMO	Liberated	27	
607	AsMO	Liberated	8	
607	AsMO	Liberated	95	5.19%
607	Native Copper	Liberated	60	
607	Native Copper	Liberated	32	0.75%
607	Cu2FeS2	Liberated	36	
607	Cu2FeS2	Inclusion	5	
607	Cu2FeS2	Inclusion	5	
607	Cu2FeS2	Inclusion	5	
607	Cu2FeS2	Inclusion	5	
607	Cu2FeS2	Inclusion	5	
607	Cu2FeS2	Liberated	55	
607	Cu2FeS2	Liberated	34	
607	Cu2FeS2	Liberated	100	
607	Cu2FeS2	Liberated	26	
607	Cu2FeS2	Liberated	18	
607	Cu2FeS2	Liberated	18	2.54%
607	Cu2S	Liberated	80	
607	Cu2S	Inclusion	12	
607	Cu2S	Inclusion	10	
607	Cu2S	Inclusion	19	
607	Cu2S	Liberated	52	
607	Cu2S	Liberated	59	
607	Cu2S	Liberated	50	
607	Cu2S	Liberated	30	
607	Cu2S	Liberated	29	
607	Cu2S	Liberated	35	
607	Cu2S	Liberated	45	
607	Cu2S	Liberated	50	
607	Cu2S	Liberated	48	
607	Cu2S	Liberated	96	
607	Cu2S	Liberated	60	
607	Cu2S	Liberated	90	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
607	Cu2S	Liberated	48	
607	Cu2S	Liberated	32	
607	Cu2S	Liberated	87	
607	Cu2S	Liberated	85	
607	Cu2S	Liberated	13	
607	Cu2S	Liberated	55	
607	Cu2S	Liberated	48	
607	Cu2S	Liberated	45	
607	Cu2S	Liberated	82	
607	Cu2S	Liberated	12	
607	Cu2S	Liberated	48	
607	Cu2S	Liberated	48	
607	Cu2S	Liberated	69	
607	Cu2S	Liberated	72	
607	Cu2S	Liberated	48	
607	Cu2S	Liberated	35	
607	Cu2S	Liberated	34	
607	Cu2S	Liberated	60	
607	Cu2S	Liberated	82	
607	Cu2S	Liberated	58	
607	Cu2S	Liberated	65	
607	Cu2S	Liberated	58	
607	Cu2S	Liberated	60	
607	Cu2S	Liberated	80	
607	Cu2S	Liberated	80	
607	Cu2S	Liberated	90	
607	Cu2S	Liberated	65	
607	Cu2S	Liberated	47	
607	Cu2S	Liberated	18	
607	Cu2S	Liberated	16	
607	Cu2S	Rimming	12	
607	Cu2S	Rimming	10	
607	Cu2S	Liberated	45	
607	Cu2S	Liberated	60	
607	Cu2S	Liberated	48	
607	Cu2S	Liberated	58	
607	Cu2S	Liberated	85	
607	Cu2S	Liberated	48	
607	Cu2S	Liberated	32	
607	Cu2S	Liberated	42	
607	Cu2S	Liberated	50	
607	Cu2S	Liberated	50	
607	Cu2S	Liberated	32	24.25%
607	Cu5FeS4	Rimming	12	
607	Cu5FeS4	Liberated	85	
607	Cu5FeS4	Liberated	55	
607	Cu5FeS4	Liberated	60	
607	Cu5FeS4	Liberated	22	
607	Cu5FeS4	Liberated	60	
607	Cu5FeS4	Liberated	28	
607	Cu5FeS4	Liberated	31	
607	Cu5FeS4	Liberated	42	
607	Cu5FeS4	Liberated	90	
607	Cu5FeS4	Liberated	41	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
607	Cu5FeS4	Cemented	35	
607	Cu5FeS4	Liberated	80	
607	Cu5FeS4	Liberated	36	
607	Cu5FeS4	Liberated	42	
607	Cu5FeS4	Liberated	34	
607	Cu5FeS4	Liberated	58	
607	Cu5FeS4	Rimming	50	
607	Cu5FeS4	Liberated	38	
607	Cu5FeS4	Liberated	28	7.55%
607	CuFe2S3	Liberated	18	
607	CuFe2S3	Liberated	80	
607	CuFe2S3	Inclusion	16	
607	CuFe2S3	Liberated	85	
607	CuFe2S3	Cemented	85	
607	CuFe2S3	Liberated	95	
607	CuFe2S3	Liberated	80	
607	CuFe2S3	Rimming	38	
607	CuFe2S3	Liberated	60	
607	CuFe2S3	Liberated	70	
607	CuFe2S3	Liberated	60	
607	CuFe2S3	Liberated	9	
607	CuFe2S3	Liberated	89	
607	CuFe2S3	Liberated	88	
607	CuFe2S3	Liberated	85	
607	CuFe2S3	Inclusion	39	
607	CuFe2S3	Liberated	19	
607	CuFe2S3	Liberated	60	
607	CuFe2S3	Rimming	32	
607	CuFe2S3	Inclusion	13	
607	CuFe2S3	Liberated	92	
607	CuFe2S3	Liberated	70	
607	CuFe2S3	Inclusion	2	
607	CuFe2S3	Inclusion	2	
607	CuFe2S3	Inclusion	2	
607	CuFe2S3	Inclusion	2	
607	CuFe2S3	Inclusion	2	
607	CuFe2S3	Inclusion	2	
607	CuFe2S3	Liberated	40	
607	CuFe2S3	Liberated	30	
607	CuFe2S3	Liberated	55	11.57%
607	CuFeS2	Liberated	13	
607	CuFeS2	Liberated	50	
607	CuFeS2	Liberated	49	
607	CuFeS2	Inclusion	2	
607	CuFeS2	Inclusion	2	
607	CuFeS2	Inclusion	2	
607	CuFeS2	Liberated	50	
607	CuFeS2	Liberated	9	
607	CuFeS2	Liberated	50	
607	CuFeS2	Liberated	36	
607	CuFeS2	Liberated	23	
607	CuFeS2	Liberated	33	
607	CuFeS2	Liberated	60	
607	CuFeS2	Liberated	90	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
607	CuFeS2	Liberated	60	
607	CuFeS2	Liberated	50	
607	CuFeS2	Liberated	58	
607	CuFeS2	Liberated	42	
607	CuFeS2	Liberated	60	
607	CuFeS2	Cemented	26	
607	CuFeS2	Rimming	12	
607	CuFeS2	Rimming	12	
607	CuFeS2	Rimming	12	
607	CuFeS2	Liberated	40	
607	CuFeS2	Liberated	35	
607	CuFeS2	Liberated	95	
607	CuFeS2	Liberated	15	
607	CuFeS2	Liberated	50	
607	CuFeS2	Liberated	45	
607	CuFeS2	Liberated	40	
607	CuFeS2	Liberated	39	9.45%
607	CuMO	Liberated	27	0.22%
607	CuO	Liberated	32	
607	CuO	Liberated	48	
607	CuO	Liberated	50	
607	CuO	Liberated	42	
607	CuO	Inclusion	60	
607	CuO	Liberated	90	
607	CuO	Liberated	47	
607	CuO	Liberated	49	
607	CuO	Cemented	32	
607	CuO	Liberated	32	
607	CuO	Liberated	50	
607	CuO	Liberated	38	
607	CuO	Liberated	62	
607	CuO	Liberated	48	
607	CuO	Liberated	55	
607	CuO	Inclusion	30	
607	CuO	Liberated	36	
607	CuO	Liberated	27	
607	CuO	Liberated	47	
607	CuO	Liberated	42	7.47%
607	CuSO4	Liberated	36	
607	CuSO4	Liberated	55	
607	CuSO4	Liberated	32	
607	CuSO4	Liberated	60	
607	CuSO4	Cemented	45	
607	CuSO4	Liberated	48	
607	CuSO4	Liberated	16	
607	CuSO4	Liberated	55	2.83%
607	FeCuOOH	Liberated	15	
607	FeCuOOH	Liberated	30	
607	FeCuOOH	Liberated	11	
607	FeCuOOH	Liberated	11	
607	FeCuOOH	Cemented	30	
607	FeCuOOH	Liberated	10	
607	FeCuOOH	Liberated	9	
607	FeCuOOH	Liberated	18	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
607	FeCuOOH	Liberated	13	
607	FeCuOOH	Liberated	40	
607	FeCuOOH	Liberated	13	
607	FeCuOOH	Cemented	23	1.82%
607	FeOOH	Liberated	24	
607	FeOOH	Liberated	28	
607	FeOOH	Liberated	5	
607	FeOOH	Liberated	25	
607	FeOOH	Liberated	55	
607	FeOOH	Cemented	100	
607	FeOOH	Liberated	48	
607	FeOOH	Liberated	50	
607	FeOOH	Cemented	15	
607	FeOOH	Liberated	10	
607	FeOOH	Liberated	85	
607	FeOOH	Cemented	32	
607	FeOOH	Liberated	10	
607	FeOOH	Liberated	10	
607	FeOOH	Liberated	10	
607	FeOOH	Liberated	5	
607	FeOOH	Liberated	5	
607	FeOOH	Liberated	5	
607	FeOOH	Liberated	5	
607	FeOOH	Liberated	5	
607	FeOOH	Liberated	5	
607	FeOOH	Rimming	28	
607	FeOOH	Liberated	82	
607	FeOOH	Liberated	89	
607	FeOOH	Liberated	48	
607	FeOOH	Liberated	59	
607	FeOOH	Liberated	7	
607	FeOOH	Liberated	7	
607	FeOOH	Liberated	7	
607	FeOOH	Liberated	7	
607	FeOOH	Liberated	7	
607	FeOOH	Liberated	7	
607	FeOOH	Liberated	7	
607	FeOOH	Liberated	48	
607	FeOOH	Liberated	22	
607	FeOOH	Liberated	50	
607	FeOOH	Cemented	180	
607	FeOOH	Liberated	95	
607	FeOOH	Liberated	49	
607	FeOOH	Liberated	30	
607	FeOOH	Cemented	48	
607	FeOOH	Liberated	90	
607	FeOOH	Liberated	90	
607	FeOOH	Liberated	50	
607	FeOOH	Cemented	135	
607	FeOOH	Rimming	46	
607	FeOOH	Liberated	50	
607	FeOOH	Liberated	25	
607	FeOOH	Cemented	55	
607	FeOOH	Liberated	14	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
607	FeOOH	Liberated	50	
607	FeOOH	Liberated	46	
607	FeOOH	Rimming	14	
607	FeOOH	Liberated	50	
607	FeOOH	Liberated	50	
607	FeOOH	Liberated	50	
607	FeOOH	Liberated	30	
607	FeOOH	Liberated	35	
607	FeOOH	Liberated	55	
607	FeOOH	Liberated	60	
607	FeOOH	Liberated	15	
607	FeOOH	Liberated	21	
607	FeOOH	Liberated	50	20.32%
607	Sulfosalt	Liberated	23	
607	Sulfosalt	Inclusion	10	
607	Sulfosalt	Inclusion	2	
607	Sulfosalt	Inclusion	2	
607	Sulfosalt	Inclusion	2	
607	Sulfosalt	Inclusion	2	
607	Sulfosalt	Inclusion	2	
607	Sulfosalt	Inclusion	2	
607	Sulfosalt	Inclusion	2	
607	Sulfosalt	Inclusion	2	0.40%
607	FeSO4	Liberated	16	
607	FeSO4	Rimming	30	
607	FeSO4	Liberated	12	
607	FeSO4	Liberated	42	
607	FeSO4	Liberated	105	
607	FeSO4	Liberated	11	
607	FeSO4	Liberated	11	
607	FeSO4	Liberated	11	
607	FeSO4	Liberated	11	
607	FeSO4	Liberated	11	
607	FeSO4	Liberated	85	
607	FeSO4	Liberated	58	
607	FeSO4	Liberated	11	
607	FeSO4	Liberated	92	
607	FeSO4	Liberated	50	
607	FeSO4	Liberated	65	
607	FeSO4	Liberated	24	
607	FeSO4	Liberated	28	
607	FeSO4	Liberated	20	5.65%
607	**TOTAL**		12276	
608	CuSO4	Liberated	33	0.89%
608	AsMO	Liberated	12	
608	AsMO	Liberated	50	
608	AsMO	Liberated	20	
608	AsMO	Liberated	120	
608	AsMO	Liberated	6	
608	AsMO	Liberated	85	
608	AsMO	Liberated	16	
608	AsMO	Liberated	13	
608	AsMO	Liberated	58	
608	AsMO	Liberated	11	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
608	AsMO	Liberated	100	13.26%
608	Cu5FeS4	Liberated	90	2.43%
608	CuFeS2	Inclusion	5	
608	CuFeS2	Inclusion	5	
608	CuFeS2	Inclusion	5	
608	CuFeS2	Inclusion	10	
608	CuFeS2	Inclusion	10	
608	CuFeS2	Inclusion	10	
608	CuFeS2	Inclusion	10	
608	CuFeS2	Inclusion	10	
608	CuFeS2	Inclusion	10	
608	CuFeS2	Inclusion	10	
608	CuFeS2	Inclusion	10	
608	CuFeS2	Inclusion	10	
608	CuFeS2	Inclusion	10	
608	CuFeS2	Cemented	8	
608	CuFeS2	Cemented	8	
608	CuFeS2	Liberated	75	
608	CuFeS2	Liberated	48	
608	CuFeS2	Liberated	40	
608	CuFeS2	Liberated	20	
608	CuFeS2	Liberated	42	
608	CuFeS2	Liberated	58	
608	CuFeS2	Liberated	58	
608	CuFeS2	Liberated	65	
608	CuFeS2	Liberated	42	15.64%
608	Cu2FeS2	Liberated	90	
608	Cu2FeS2	Rimming	35	
608	Cu2FeS2	Liberated	60	
608	Cu2FeS2	Liberated	20	
608	Cu2FeS2	Liberated	50	
608	Cu2FeS2	Liberated	32	
608	Cu2FeS2	Liberated	88	10.13%
608	CuFe2S3	Liberated	100	
608	CuFe2S3	Rimming	60	
608	CuFe2S3	Liberated	80	
608	CuFe2S3	Liberated	20	
608	CuFe2S3	Liberated	50	
608	CuFe2S3	Liberated	78	
608	CuFe2S3	Liberated	25	
608	CuFe2S3	Liberated	98	
608	CuFe2S3	Liberated	50	
608	CuFe2S3	Liberated	48	16.45%
608	FeOOH	Liberated	16	
608	FeOOH	Liberated	18	
608	FeOOH	Rimming	50	
608	FeOOH	Cemented	16	
608	FeOOH	Liberated	43	
608	FeOOH	Rimming	35	
608	FeOOH	Liberated	21	
608	FeOOH	Rimming	50	
608	FeOOH	Cemented	120	
608	FeOOH	Cemented	14	
608	FeOOH	Liberated	32	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
608	FeOOH	Liberated	108	
608	FeOOH	Liberated	31	
608	FeOOH	Liberated	11	
608	FeOOH	Liberated	16	
608	FeOOH	Liberated	14	
608	FeOOH	Liberated	26	
608	FeOOH	Liberated	33	
608	FeOOH	Liberated	90	
608	FeOOH	Liberated	38	
608	FeOOH	Inclusion	4	
608	FeOOH	Liberated	42	
608	FeOOH	Liberated	19	22.87%
608	FeCuOOH	Liberated	22	
608	FeCuOOH	Liberated	26	
608	FeCuOOH	Liberated	13	1.65%
608	Cu2S	Liberated	85	
608	Cu2S	Liberated	50	
608	Cu2S	Liberated	55	
608	Cu2S	Liberated	8	5.35%
608	Native Copper	Liberated	47	
608	Native Copper	Liberated	14	
608	Native Copper	Liberated	50	
608	Native Copper	Liberated	15	
608	Native Copper	Liberated	50	4.75%
608	CuO	Liberated	23	0.62%
608	Sulfosalt	Liberated	35	0.95%
608	FeSO4	Liberated	18	
608	FeSO4	Liberated	32	
608	FeSO4	Liberated	105	
608	FeSO4	Liberated	23	
608	FeSO4	Liberated	8	5.02%
608	**TOTAL**		3703	
609	CuSO4	Liberated	30	
609	CuSO4	Liberated	12	
609	CuSO4	Liberated	9	
609	CuSO4	Liberated	25	
609	CuSO4	Liberated	30	
609	CuSO4	Liberated	26	
609	CuSO4	Liberated	80	
609	CuSO4	Liberated	80	
609	CuSO4	Liberated	50	
609	CuSO4	Liberated	40	
609	CuSO4	Liberated	70	
609	CuSO4	Liberated	42	
609	CuSO4	Liberated	18	
609	CuSO4	Liberated	60	
609	CuSO4	Liberated	50	
609	CuSO4	Liberated	48	7.38%
609	AsMO	Cemented	35	
609	AsMO	Liberated	11	
609	AsMO	Liberated	38	
609	AsMO	Liberated	87	
609	AsMO	Liberated	11	
609	AsMO	Cemented	32	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
609	AsMO	Cemented	35	
609	AsMO	Cemented	28	
609	AsMO	Liberated	11	
609	AsMO	Liberated	14	
609	AsMO	Liberated	13	
609	AsMO	Cemented	26	
609	AsMO	Liberated	13	
609	AsMO	Liberated	20	
609	AsMO	Rimming	15	
609	AsMO	Rimming	11	
609	AsMO	Rimming	12	
609	AsMO	Liberated	35	
609	AsMO	Liberated	26	5.21%
609	Cu5FeS4	Rimming	40	
609	Cu5FeS4	Liberated	8	
609	Cu5FeS4	Liberated	22	
609	Cu5FeS4	Liberated	40	
609	Cu5FeS4	Liberated	11	
609	Cu5FeS4	Liberated	15	
609	Cu5FeS4	Liberated	90	
609	Cu5FeS4	Liberated	28	
609	Cu5FeS4	Liberated	14	
609	Cu5FeS4	Liberated	38	
609	Cu5FeS4	Liberated	60	
609	Cu5FeS4	Liberated	43	
609	Cu5FeS4	Inclusion	14	
609	Cu5FeS4	Cemented	38	
609	Cu5FeS4	Liberated	60	
609	Cu5FeS4	Liberated	60	
609	Cu5FeS4	Liberated	60	
609	Cu5FeS4	Liberated	28	
609	Cu5FeS4	Liberated	55	
609	Cu5FeS4	Liberated	28	
609	Cu5FeS4	Liberated	19	
609	Cu5FeS4	Liberated	105	9.21%
609	CuFeS2	Liberated	10	
609	CuFeS2	Liberated	22	
609	CuFeS2	Liberated	30	
609	CuFeS2	Liberated	50	
609	CuFeS2	Liberated	23	
609	CuFeS2	Liberated	80	
609	CuFeS2	Inclusion	10	
609	CuFeS2	Rimming	13	
609	CuFeS2	Liberated	50	
609	CuFeS2	Liberated	58	
609	CuFeS2	Liberated	8	
609	CuFeS2	Liberated	45	
609	CuFeS2	Liberated	38	
609	CuFeS2	Liberated	42	
609	CuFeS2	Liberated	32	
609	CuFeS2	Liberated	48	
609	CuFeS2	Liberated	24	
609	CuFeS2	Liberated	108	
609	CuFeS2	Liberated	68	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
609	CuFeS2	Liberated	30	
609	CuFeS2	Liberated	28	
609	CuFeS2	Liberated	12	
609	CuFeS2	Liberated	20	
609	CuFeS2	Liberated	35	
609	CuFeS2	Liberated	45	
609	CuFeS2	Liberated	48	
609	CuFeS2	Liberated	50	
609	CuFeS2	Liberated	27	
609	CuFeS2	Liberated	100	
609	CuFeS2	Liberated	30	
609	CuFeS2	Liberated	65	
609	CuFeS2	Liberated	30	
609	CuFeS2	Liberated	14	
609	CuFeS2	Liberated	13	
609	CuFeS2	Liberated	85	
609	CuFeS2	Liberated	48	
609	CuFeS2	Liberated	30	
609	CuFeS2	Liberated	35	
609	CuFeS2	Liberated	70	17.33%
609	Cu2FeS2	Liberated	45	
609	Cu2FeS2	Liberated	50	
609	Cu2FeS2	Rimming	40	
609	Cu2FeS2	Liberated	14	
609	Cu2FeS2	Liberated	20	
609	Cu2FeS2	Liberated	80	
609	Cu2FeS2	Liberated	20	
609	Cu2FeS2	Liberated	42	
609	Cu2FeS2	Liberated	60	4.09%
609	CuFe2S3	Inclusion	35	
609	CuFe2S3	Liberated	30	
609	CuFe2S3	Liberated	55	
609	CuFe2S3	Liberated	38	
609	CuFe2S3	Liberated	85	
609	CuFe2S3	Rimming	20	
609	CuFe2S3	Cemented	23	
609	CuFe2S3	Liberated	12	
609	CuFe2S3	Liberated	48	
609	CuFe2S3	Liberated	25	
609	CuFe2S3	Liberated	75	
609	CuFe2S3	Liberated	80	
609	CuFe2S3	Cemented	36	
609	CuFe2S3	Liberated	22	
609	CuFe2S3	Inclusion	7	
609	CuFe2S3	Inclusion	7	
609	CuFe2S3	Inclusion	7	
609	CuFe2S3	Inclusion	7	
609	CuFe2S3	Inclusion	7	
609	CuFe2S3	Liberated	26	
609	CuFe2S3	Liberated	50	
609	CuFe2S3	Liberated	48	
609	CuFe2S3	Liberated	45	8.68%
609	FeOOH	Rimming	28	
609	FeOOH	Rimming	45	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
609	FeOOH	Cemented	90	
609	FeOOH	Liberated	28	
609	FeOOH	Liberated	12	
609	FeOOH	Liberated	14	
609	FeOOH	Liberated	13	
609	FeOOH	Liberated	80	
609	FeOOH	Liberated	26	
609	FeOOH	Rimming	48	
609	FeOOH	Liberated	17	
609	FeOOH	Liberated	14	
609	FeOOH	Liberated	35	
609	FeOOH	Liberated	16	
609	FeOOH	Liberated	11	
609	FeOOH	Liberated	26	
609	FeOOH	Liberated	9	
609	FeOOH	Liberated	30	
609	FeOOH	Rimming	25	
609	FeOOH	Cemented	26	
609	FeOOH	Liberated	85	
609	FeOOH	Liberated	80	
609	FeOOH	Cemented	78	
609	FeOOH	Liberated	13	
609	FeOOH	Cemented	26	
609	FeOOH	Liberated	50	
609	FeOOH	Rimming	30	
609	FeOOH	Liberated	9	
609	FeOOH	Liberated	42	
609	FeOOH	Rimming	20	
609	FeOOH	Liberated	55	
609	FeOOH	Cemented	30	
609	FeOOH	Liberated	85	
609	FeOOH	Liberated	85	
609	FeOOH	Liberated	85	
609	FeOOH	Liberated	85	
609	FeOOH	Liberated	14	
609	FeOOH	Rimming	40	
609	FeOOH	Liberated	26	
609	FeOOH	Liberated	20	
609	FeOOH	Liberated	35	
609	FeOOH	Liberated	36	
609	FeOOH	Rimming	35	
609	FeOOH	Liberated	8	
609	FeOOH	Liberated	14	
609	FeOOH	Liberated	35	
609	FeOOH	Liberated	50	
609	FeOOH	Liberated	22	
609	FeOOH	Rimming	18	
609	FeOOH	Rimming	35	
609	FeOOH	Liberated	18	20.45%
609	FeCuOOH	Liberated	16	
609	FeCuOOH	Liberated	8	
609	FeCuOOH	Liberated	7	
609	FeCuOOH	Liberated	22	
609	FeCuOOH	Liberated	25	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
609	FeCuOOH	Liberated	14	
609	FeCuOOH	Liberated	11	
609	FeCuOOH	Liberated	22	
609	FeCuOOH	Liberated	18	1.57%
609	Cu2S	Inclusion	5	
609	Cu2S	Inclusion	5	
609	Cu2S	Inclusion	5	
609	Cu2S	Inclusion	5	
609	Cu2S	Liberated	28	
609	Cu2S	Liberated	50	
609	Cu2S	Liberated	15	
609	Cu2S	Liberated	42	
609	Cu2S	Liberated	45	
609	Cu2S	Liberated	45	
609	Cu2S	Liberated	11	
609	Cu2S	Liberated	13	
609	Cu2S	Liberated	52	
609	Cu2S	Liberated	45	
609	Cu2S	Rimming	15	
609	Cu2S	Liberated	29	
609	Cu2S	Liberated	45	
609	Cu2S	Liberated	26	
609	Cu2S	Liberated	42	
609	Cu2S	Liberated	50	
609	Cu2S	Liberated	50	
609	Cu2S	Liberated	45	
609	Cu2S	Liberated	32	
609	Cu2S	Liberated	90	
609	Cu2S	Liberated	30	
609	Cu2S	Liberated	50	
609	Cu2S	Liberated	55	
609	Cu2S	Liberated	82	
609	Cu2S	Rimming	20	
609	Cu2S	Liberated	50	
609	Cu2S	Liberated	38	12.28%
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Liberated	32	
609	Native Copper	Inclusion	11	
609	Native Copper	Inclusion	10	
609	Native Copper	Inclusion	1	
609	Native Copper	Inclusion	1	
609	Native Copper	Inclusion	1	
609	Native Copper	Inclusion	1	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
609	Native Copper	Inclusion	1	
609	Native Copper	Inclusion	1	
609	Native Copper	Inclusion	1	
609	Native Copper	Inclusion	1	
609	Native Copper	Inclusion	1	
609	Native Copper	Inclusion	1	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Liberated	55	
609	Native Copper	Liberated	75	
609	Native Copper	Liberated	50	
609	Native Copper	Inclusion	36	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	
609	Native Copper	Inclusion	2	3.78%
609	CuO	Inclusion	12	
609	CuO	Liberated	16	
609	CuO	Liberated	50	
609	CuO	Rimming	21	
609	CuO	Liberated	80	
609	CuO	Inclusion	24	
609	CuO	Inclusion	26	
609	CuO	Liberated	18	
609	CuO	Inclusion	14	
609	CuO	Liberated	15	
609	CuO	Liberated	15	
609	CuO	Liberated	15	
609	CuO	Liberated	10	
609	CuO	Liberated	10	
609	CuO	Liberated	10	
609	CuO	Liberated	10	
609	CuO	Rimming	40	
609	CuO	Inclusion	22	
609	CuO	Liberated	30	4.82%
609	Sulfosalt	Liberated	108	
609	Sulfosalt	Liberated	18	1.39%
609	FeSO4	Liberated	35	
609	FeSO4	Liberated	32	
609	FeSO4	Liberated	26	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
609	FeSO4	Liberated	26	
609	FeSO4	Liberated	20	
609	FeSO4	Liberated	26	
609	FeSO4	Liberated	13	
609	FeSO4	Liberated	18	
609	FeSO4	Liberated	36	
609	FeSO4	Liberated	25	
609	FeSO4	Liberated	50	3.38%
609	**TOTAL**		9081	
610	CuSO4	Cemented	25	
610	CuSO4	Cemented	28	
610	CuSO4	Rimming	28	
610	CuSO4	Liberated	29	
610	CuSO4	Liberated	60	
610	CuSO4	Liberated	32	
610	CuSO4	Liberated	8	3.76%
610	AsMO	Cemented	48	
610	AsMO	Cemented	42	
610	AsMO	Liberated	14	
610	AsMO	Cemented	92	
610	AsMO	Liberated	44	
610	AsMO	Cemented	160	
610	AsMO	Liberated	90	8.78%
610	Cu5FeS4	Liberated	92	
610	Cu5FeS4	Liberated	30	
610	Cu5FeS4	Liberated	8	
610	Cu5FeS4	Liberated	45	
610	Cu5FeS4	Liberated	30	
610	Cu5FeS4	Liberated	7	
610	Cu5FeS4	Liberated	14	
610	Cu5FeS4	Rimming	35	
610	Cu5FeS4	Liberated	50	
610	Cu5FeS4	Liberated	20	
610	Cu5FeS4	Liberated	26	
610	Cu5FeS4	Liberated	45	
610	Cu5FeS4	Liberated	22	
610	Cu5FeS4	Liberated	9	
610	Cu5FeS4	Liberated	48	
610	Cu5FeS4	Liberated	7	8.74%
610	CuFeS2	Liberated	9	
610	CuFeS2	Liberated	40	
610	CuFeS2	Liberated	55	
610	CuFeS2	Cemented	8	
610	CuFeS2	Cemented	12	
610	CuFeS2	Inclusion	22	
610	CuFeS2	Rimming	29	
610	CuFeS2	Liberated	40	
610	CuFeS2	Liberated	25	
610	CuFeS2	Liberated	7	
610	CuFeS2	Liberated	7	
610	CuFeS2	Liberated	8	
610	CuFeS2	Liberated	32	
610	CuFeS2	Cemented	4	
610	CuFeS2	Cemented	4	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
610	CuFeS2	Cemented	4	
610	CuFeS2	Cemented	4	
610	CuFeS2	Liberated	31	
610	CuFeS2	Inclusion	7	
610	CuFeS2	Liberated	55	
610	CuFeS2	Inclusion	10	
610	CuFeS2	Inclusion	10	
610	CuFeS2	Cemented	45	
610	CuFeS2	Liberated	26	
610	CuFeS2	Liberated	50	
610	CuFeS2	Liberated	19	
610	CuFeS2	Inclusion	11	
610	CuFeS2	Liberated	26	
610	CuFeS2	Liberated	23	
610	CuFeS2	Liberated	38	
610	CuFeS2	Liberated	90	
610	CuFeS2	Liberated	90	
610	CuFeS2	Liberated	95	
610	CuFeS2	Liberated	32	17.34%
610	CuFe2S3	Liberated	12	
610	CuFe2S3	Liberated	20	
610	CuFe2S3	Liberated	90	
610	CuFe2S3	Liberated	13	
610	CuFe2S3	Liberated	35	
610	CuFe2S3	Liberated	30	
610	CuFe2S3	Liberated	34	
610	CuFe2S3	Liberated	45	
610	CuFe2S3	Liberated	25	
610	CuFe2S3	Liberated	85	
610	CuFe2S3	Liberated	50	
610	CuFe2S3	Liberated	90	
610	CuFe2S3	Liberated	50	
610	CuFe2S3	Liberated	13	
610	CuFe2S3	Liberated	65	
610	CuFe2S3	Liberated	30	
610	CuFe2S3	Liberated	110	14.27%
610	FeOOH	Liberated	60	
610	FeOOH	Cemented	10	
610	FeOOH	Cemented	10	
610	FeOOH	Liberated	40	
610	FeOOH	Liberated	16	
610	FeOOH	Cemented	49	
610	FeOOH	Liberated	14	
610	FeOOH	Cemented	45	
610	FeOOH	Liberated	30	
610	FeOOH	Liberated	32	
610	FeOOH	Liberated	48	
610	FeOOH	Liberated	12	
610	FeOOH	Rimming	42	
610	FeOOH	Rimming	22	
610	FeOOH	Rimming	16	
610	FeOOH	Liberated	5	
610	FeOOH	Liberated	24	
610	FeOOH	Liberated	9	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
610	FeOOH	Cemented	18	
610	FeOOH	Liberated	95	
610	FeOOH	Cemented	6	
610	FeOOH	Cemented	6	
610	FeOOH	Cemented	6	
610	FeOOH	Cemented	6	
610	FeOOH	Cemented	6	
610	FeOOH	Cemented	6	
610	FeOOH	Cemented	18	
610	FeOOH	Liberated	30	
610	FeOOH	Cemented	42	
610	FeOOH	Liberated	32	
610	FeOOH	Liberated	9	
610	FeOOH	Liberated	24	
610	FeOOH	Liberated	8	
610	FeOOH	Liberated	27	
610	FeOOH	Cemented	23	
610	FeOOH	Liberated	7	
610	FeOOH	Cemented	29	
610	FeOOH	Liberated	60	
610	FeOOH	Liberated	22	
610	FeOOH	Liberated	24	
610	FeOOH	Liberated	5	
610	FeOOH	Cemented	28	
610	FeOOH	Liberated	16	
610	FeOOH	Liberated	13	
610	FeOOH	Liberated	11	
610	FeOOH	Rimming	30	
610	FeOOH	Rimming	30	
610	FeOOH	Cemented	48	
610	FeOOH	Liberated	25	
610	FeOOH	Liberated	24	
610	FeOOH	Liberated	85	
610	FeOOH	Liberated	25	
610	FeOOH	Liberated	22	
610	FeOOH	Liberated	35	24.80%
610	FeCuOOH	Liberated	9	
610	FeCuOOH	Liberated	28	
610	FeCuOOH	Liberated	6	
610	FeCuOOH	Cemented	4	
610	FeCuOOH	Cemented	11	
610	FeCuOOH	Liberated	9	
610	FeCuOOH	Liberated	6	
610	FeCuOOH	Liberated	8	
610	FeCuOOH	Cemented	12	
610	FeCuOOH	Liberated	38	
610	FeCuOOH	Liberated	26	
610	FeCuOOH	Cemented	32	
610	FeCuOOH	Liberated	30	
610	FeCuOOH	Liberated	22	4.32%
610	Cu2S	Liberated	35	
610	Cu2S	Liberated	20	
610	Cu2S	Liberated	48	
610	Cu2S	Liberated	15	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
610	Cu2S	Liberated	42	
610	Cu2S	Liberated	90	
610	Cu2S	Liberated	22	
610	Cu2S	Liberated	115	6.93%
610	MnOOH	Liberated	14	0.25%
610	Native Copper	Inclusion	12	
610	Native Copper	Inclusion	12	
610	Native Copper	Inclusion	12	
610	Native Copper	Inclusion	12	
610	Native Copper	Inclusion	12	
610	Native Copper	Inclusion	12	
610	Native Copper	Inclusion	2	
610	Native Copper	Inclusion	2	
610	Native Copper	Inclusion	2	
610	Native Copper	Inclusion	2	
610	Native Copper	Inclusion	2	
610	Native Copper	Inclusion	2	1.50%
610	CuO	Liberated	32	
610	CuO	Liberated	14	
610	CuO	Liberated	11	
610	CuO	Rimming	4	
610	CuO	Liberated	28	1.59%
610	FeSO4	Liberated	5	
610	FeSO4	Cemented	32	
610	FeSO4	Liberated	28	
610	FeSO4	Cemented	11	
610	FeSO4	Rimming	32	
610	FeSO4	Liberated	24	
610	FeSO4	Liberated	28	
610	FeSO4	Liberated	22	
610	FeSO4	Liberated	18	
610	FeSO4	Cemented	42	
610	FeSO4	Cemented	44	
610	FeSO4	Liberated	10	
610	FeSO4	Cemented	11	
610	FeSO4	Liberated	29	
610	FeSO4	Liberated	60	
610	FeSO4	Liberated	20	
610	FeSO4	Rimming	15	7.72%
610	**TOTAL**		5584	
611	CuSO4	Rimming	12	
611	CuSO4	Liberated	48	5.47%
611	AsMO	Liberated	75	
611	AsMO	Liberated	30	
611	AsMO	Liberated	82	17.06%
611	Cu5FeS4	Cemented	16	
611	Cu5FeS4	Cemented	3	
611	Cu5FeS4	Liberated	105	11.31%
611	Brass	Liberated	50	4.56%
611	CuFeS2	Cemented	10	
611	CuFeS2	Cemented	11	
611	CuFeS2	Liberated	20	
611	CuFeS2	Liberated	8	
611	CuFeS2	Liberated	32	7.39%

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
611	Cu2FeS2	Liberated	30	2.74%
611	CuFe2S3	Inclusion	1	
611	CuFe2S3	Inclusion	1	
611	CuFe2S3	Inclusion	1	
611	CuFe2S3	Inclusion	1	
611	CuFe2S3	Liberated	60	5.84%
611	FeOOH	Liberated	11	
611	FeOOH	Cemented	45	
611	FeOOH	Liberated	90	
611	FeOOH	Liberated	28	
611	FeOOH	Rimming	33	
611	FeOOH	Liberated	10	
611	FeOOH	Cemented	48	24.18%
611	FeCuOOH	Liberated	9	
611	FeCuOOH	Liberated	11	1.82%
611	Cu2S	Liberated	31	2.83%
611	Native Copper	Liberated	12	1.09%
611	CuO	Liberated	25	
611	CuO	Cemented	28	2.55%
611	FeSO4	Cemented	80	
611	FeSO4	Liberated	16	
611	FeSO4	Liberated	7	
611	FeSO4	Liberated	16	10.86%
611	**TOTAL**		1096	
612	CuSO4	Liberated	32	
612	CuSO4	Liberated	45	
612	CuSO4	Liberated	42	
612	CuSO4	Liberated	31	3.38%
612	AsMO	Liberated	12	
612	AsMO	Liberated	11	
612	AsMO	Liberated	38	
612	AsMO	Cemented	8	
612	AsMO	Cemented	42	2.50%
612	Cu5FeS4	Rimming	12	
612	Cu5FeS4	Liberated	22	
612	Cu5FeS4	Liberated	35	
612	Cu5FeS4	Liberated	50	
612	Cu5FeS4	Cemented	21	
612	Cu5FeS4	Liberated	26	
612	Cu5FeS4	Liberated	55	
612	Cu5FeS4	Liberated	50	
612	Cu5FeS4	Liberated	80	
612	Cu5FeS4	Liberated	80	
612	Cu5FeS4	Liberated	12	
612	Cu5FeS4	Liberated	45	
612	Cu5FeS4	Liberated	40	11.91%
612	CuFeS2	Liberated	22	
612	CuFeS2	Liberated	28	
612	CuFeS2	Liberated	28	
612	CuFeS2	Liberated	20	
612	CuFeS2	Liberated	28	
612	CuFeS2	Liberated	15	
612	CuFeS2		24	
612	CuFeS2	Liberated	11	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
612	CuFeS2	Liberated	125	
612	CuFeS2	Liberated	13	
612	CuFeS2	Cemented	38	
612	CuFeS2	Liberated	55	
612	CuFeS2	Liberated	6	
612	CuFeS2	Liberated	30	
612	CuFeS2	Liberated	25	
612	CuFeS2	Liberated	14	
612	CuFeS2	Liberated	95	
612	CuFeS2	Liberated	14	
612	CuFeS2	Liberated	105	
612	CuFeS2	Liberated	11	
612	CuFeS2	Liberated	22	
612	CuFeS2	Liberated	47	
612	CuFeS2	Liberated	29	
612	CuFeS2	Liberated	85	
612	CuFeS2	Liberated	9	
612	CuFeS2	Inclusion	5	
612	CuFeS2	Inclusion	5	
612	CuFeS2	Inclusion	5	
612	CuFeS2	Inclusion	5	
612	CuFeS2	Inclusion	5	
612	CuFeS2	Inclusion	5	
612	CuFeS2	Inclusion	5	
612	CuFeS2	Liberated	38	
612	CuFeS2	Liberated	45	
612	CuFeS2	Liberated	19	
612	CuFeS2	Liberated	20	
612	CuFeS2	Liberated	35	24.60%
612	Cu2FeS2	Liberated	39	
612	Cu2FeS2	Liberated	90	
612	Cu2FeS2	Liberated	88	
612	Cu2FeS2	Liberated	45	
612	Cu2FeS2	Liberated	70	
612	Cu2FeS2	Liberated	24	8.03%
612	CuFe2S3	Rimming	20	
612	CuFe2S3	Liberated	18	
612	CuFe2S3	Liberated	27	
612	CuFe2S3	Liberated	30	
612	CuFe2S3	Liberated	25	
612	CuFe2S3	Liberated	11	
612	CuFe2S3	Liberated	38	
612	CuFe2S3	Liberated	42	
612	CuFe2S3	Liberated	38	
612	CuFe2S3	Liberated	28	
612	CuFe2S3	Liberated	80	
612	CuFe2S3	Rimming	30	
612	CuFe2S3	Liberated	55	9.97%
612	FeOOH	Liberated	40	
612	FeOOH	Liberated	8	
612	FeOOH	Liberated	80	
612	FeOOH	Liberated	12	
612	FeOOH	Cemented	95	
612	FeOOH	Cemented	85	

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
612	FeOOH	Liberated	8	
612	FeOOH	Liberated	8	
612	FeOOH	Cemented	95	
612	FeOOH	Liberated	5	
612	FeOOH	Liberated	22	
612	FeOOH	Liberated	26	
612	FeOOH	Liberated	12	
612	FeOOH	Rimming	7	
612	FeOOH	Cemented	20	
612	FeOOH	Cemented	85	
612	FeOOH	Liberated	95	
612	FeOOH	Liberated	20	
612	FeOOH	Liberated	55	
612	FeOOH	Liberated	47	
612	FeOOH	Liberated	17	
612	FeOOH	Liberated	9	
612	FeOOH	Cemented	14	
612	FeOOH	Liberated	17	
612	FeOOH	Liberated	40	
612	FeOOH	Cemented	100	
612	FeOOH	Liberated	20	
612	FeOOH	Inclusion	12	
612	FeOOH	Liberated	40	
612	FeOOH	Liberated	38	
612	FeOOH	Liberated	30	
612	FeOOH	Liberated	90	
612	FeOOH	Liberated	30	
612	FeOOH	Liberated	20	29.36%
612	FeCuOOH	Liberated	35	
612	FeCuOOH	Liberated	11	
612	FeCuOOH	Liberated	52	
612	FeCuOOH	Liberated	28	
612	FeCuOOH	Liberated	5	
612	FeCuOOH	Liberated	10	
612	FeCuOOH	Liberated	25	
612	FeCuOOH	Liberated	14	
612	FeCuOOH	Cemented	12	
612	FeCuOOH	Liberated	14	
612	FeCuOOH	Liberated	11	4.89%
612	Cu2S	Liberated	20	
612	Cu2S	Cemented	11	
612	Cu2S	Cemented	11	
612	Cu2S	Cemented	11	
612	Cu2S	Rimming	10	
612	Cu2S	Rimming	12	
612	Cu2S	Rimming	5	1.80%
612	Native Copper	Inclusion	32	0.72%
612	CuO	Liberated	16	0.36%
612	Sulfosalt	Liberated	19	
612	Sulfosalt	Liberated	14	0.74%
612	FeSO4	Rimming	22	
612	FeSO4	Liberated	14	
612	FeSO4	Liberated	27	
612	FeSO4	Liberated	14	1.74%

TABLE A5-2
PARTICLES IDENTIFIED BY ELECTRON MICROPROBE ANALYSIS

Sample ID	Particle	Description	Frequency	Sum
612	**TOTAL**		4435	
613	AsMO	Liberated	12	3.09%
613	Cu5FeS4	Cemented	1	
613	Cu5FeS4	Cemented	1	
613	Cu5FeS4	Cemented	1	
613	Cu5FeS4	Cemented	1	
613	Cu5FeS4	Cemented	1	1.29%
613	Brass	Liberated	17	4.38%
613	Cu2FeS2	Liberated	14	3.61%
613	CuFeS3	Liberated	45	
613	CuFeS3	Liberated	28	18.81%
613	FeOOH	Liberated	11	
613	FeOOH	Cemented	26	
613	FeOOH	Cemented	16	
613	FeOOH	Cemented	32	
613	FeOOH	Cemented	25	
613	FeOOH	Cemented	38	
613	FeOOH	Cemented	28	
613	FeOOH	Cemented	18	
613	FeOOH	Liberated	40	60.31%
613	FeCuOOH	Liberated	8	
613	FeCuOOH	Liberated	20	7.22%
613	Cu2S	Cemented	1	
613	Cu2S	Cemented	1	
613	Cu2S	Cemented	1	
613	Cu2S	Cemented	1	
613	Cu2S	Cemented	1	1.29%
613	**TOTAL**		388	

Appendix A6
Summary of Golder February 2008 Sampling Event

Innovative Technical Solutions, Inc.

April 8, 2008

Dr. Casey McKeon
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

RE: ITSI DATA VALIDATION REPORT
RESOLUTION COPPER
PURCHASE ORDER NO. 3100096293
SDGs 132004, 132005 and 132006

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) has completed the data review for Resolution Copper Company (RCC) for its Human Health Risk Assessment (HHRA) Resolution soil samples. ITSI performed data review as described in the U.S. Environmental Protection Agency's (EPA) *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004; the Quality Assurance Project Plan(QAPP), Section 5.0, Volume 3 – Appendices, *Aquifer Protection Permit Application,* West Plant Site, Superior Mine, Superior, Arizona, 2005 and using criteria in the referenced method.

The list of acronyms and abbreviations is included as Appendix A. Data review qualifiers have been marked in red directly on the analytical reports provided by the laboratory and are attached as Appendix B. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C. The ITSI standard legal notice is provided as Appendix D.

1.0 CROSS REFERENCE OF SAMPLES VERIFIED

The analytical data in the laboratory Sample Delivery Groups (SDGs) 132004, 132005 and 132006 were reviewed. These SDGs contained data for inductively coupled plasma/atomic emission spectroscopy (ICP/AES) arsenic (As), copper (Cu) and lead (Pb) by EPA Method 6010B.

The samples were analyzed by SVL Analytical (SVL) of Kellogg, Idaho. The table below provides an analytical summary and cross reference for the samples. All samples underwent a level 4 data validation.

1501 West Fountainhead Parkway, Suite 360
Tempe, AZ 85282

(480) 706-6488
fax (480) 704-2952
www.itsi.com

SDG	Field Sample ID	SVL Number	Sample Matrix	Collection Date	As, Cu and Pb by 6010B
132004	EMF-07HHRA-001	S610992	Soil	2/27/08	X
132004	EMF-07HHRA-002	S610993	Soil	2/27/08	X
132004	EMF-07HHRA-003	S610994	Soil	2/27/08	X
132004	EMF-07HHRA-004	S610995	Soil	2/27/08	X
132004	EMF-07HHRA-005	S610996	Soil	2/27/08	X
132004	EMF-07HHRA-006	S610997	Soil	2/27/08	X
132004	BFD-2	S610998	Soil	2/27/08	X
132005	SKW-07HHRA-001	S611001	Soil	2/29/08	X
132005	SKW-07HHRA-002	S611002	Soil	2/29/08	X
132005	SKW-07HHRA-003	S611003	Soil	2/29/08	X
132005	SKW-07HHRA-004	S611004	Soil	2/29/08	X
132005	SKW-07HHRA-005	S611005	Soil	2/29/08	X
132005	SKW-07HHRA-006	S611006	Soil	2/29/08	X
132005	BFD-4	S611007	Soil	2/29/08	X
132006	NMF-07HHRA-001	S611010	Soil	2/28/08	X
132006	NMF-07HHRA-002	S611011	Soil	2/28/08	X
132006	NMF-07HHRA-003	S611012	Soil	2/28/08	X
132006	NMF-07HHRA-004	S611013	Soil	2/28/08	X
132006	NMF-07HHRA-005	S611014	Soil	2/28/08	X
132006	NMF-07HHRA-006	S611015	Soil	2/26/08	X
132006	NMF-07HHRA-007	S611016	Soil	2/25/08	X
132006	NMF-07HHRA-008	S611017	Soil	2/26/08	X
132006	NMF-07HHRA-009	S611018	Soil	2/25/08	X
132006	NMF-07HHRA-010	S611019	Soil	2/26/08	X
132006	NMF-07HHRA-011	S611020	Soil	2/26/08	X
132006	NMF-07HHRA-012	S611021	Soil	2/27/08	X
132006	NMF-07HHRA-013	S611022	Soil	2/26/08	X
132006	NMF-07HHRA-014	S611023	Soil	2/27/08	X
132006	NMF-07HHRA-015	S611024	Soil	2/27/08	X
132006	BFD-1	S611025	Soil	2/26/08	X
132006	BFD-3	S611026	Soil	2/28/08	X

2.0 LABORATORY REPORT

The laboratory report was reviewed for completeness. There were no anomalies observed.

3.0 SAMPLE INTEGRITY

The chains-of-custody (COCs) were available for review. There were no anomalies that required qualification of the data.

4.0 SAMPLE RECEIPT AND HOLDING TIMES

The samples were extracted and analyzed within the method-recommended holding time.

5.0 BLANK EVALUATION

Preparation and calibration blanks were analyzed to assess laboratory contamination. No qualification of the data was required due to compounds detected in any of the blanks.

6.0 INITIAL AND CONTINUING CALIBRATION

The initial and continuing calibration data and summaries were reviewed. All calibration standards were analyzed at the proper frequency and met the method or Quality Assurance Project Plan (QAPP) criteria.

7.0 LABORATORY CONTROL SAMPLES (LCS

An LCS was analyzed for each analysis. All recoveries were within control limits.

8.0 MATRIX SPIKE (MS)/MATRIX SPIKE DUPLICATE (MSD)

MS/MSD pairs were analyzed for each analysis. There were no anomalies that required qualification of the data.

9.0 DETECTION LIMIT CHECK STANDARD (CRQL)

A CRQL check standard was analyzed prior to the samples analysis. All recoveries were within control limits.

10.0 SECOND SOURCE CALIBRATION VERIFICATION (SSCV)

The initial calibration verification (ICV) and continuing calibration verification (CCV) were prepared as the SSCV. All recoveries were within control limits

11.0 INTERNAL STANDARD

In lieu of performing a serial dilution on the sample matrix, internal standards were added to each sample and QC sample to check for physical or chemical interferences in the sample matrix. All internal standard recoveries were within control limits.

12.0 PRACTICAL QUANTITATION LIMITS (PQLS) AND COMPOUND QUANTITATION

The laboratory PQLs and sample results were reviewed. There were no anomalies that required qualification of the data.

13.0 INTRUMENT PERFORMANCE

Interference check samples were reviewed to verify that inter-element correction factors were functioning. There were no anomalies observed.

14.0 FIELD DUPLICATE SAMPLES

Field duplicate pairs were collected and analyzed. The identity of the field duplicate pairs and the RPD evaluations for the positive results are listed in the table below.

Primary and Duplicate Samples	SDG	Analyte	Primary Sample Result mg/kg	Duplicate Sample Result mg/kg	RPD
EMF-07HHRA-001 BFD-2	132004	Arsenic	39.1	38.2	2.3
		Copper	215	212	1.4
		Lead	94.5	104	9.6
SKW-07HHRA-003 BFD-4	132005	Arsenic	55.9	53.5	4.4
		Copper	721	677	6.3
		Lead	76.9	75.0	2.5
NMF-07HHRA-003 BFD-3	132006	Arsenic	64.3	82.2	24.4
		Copper	865	1250	36.4
		Lead	87.9	110	22.3
NMF-07HHRA-013 BFD-1	132006	Arsenic	44.0	41.2	6.6
		Copper	240	219	9.2
		Lead	161	156	3.2

The RPD for copper in field duplicate pair NMF-07HHRA-003/BFD-3 is out of the QAPP criteria of less than 35 at 36.4. Duplicate soil sample results which exceed the RPD limits are most likely due to the heterogeneous nature of contaminant distribution in soil matrices. The copper results in the duplicate pair NMF-07HHRA-003/BFD-3 have been flagged "J" for an estimated value.

15.0 RECOMMENDATIONS

The client ID for sample BFD-1 from SDG 132006 is incorrectly identified as "BFD" on Form 1. ITSI recommends that Golder obtain an amended report from SVL for this sample.

16.0 OVERALL ASSESSMENT FOR SDG

There were no rejected results. Based on the available information, the other data as qualified are considered useable for their intended purposes.

We thank you for the opportunity to serve you and look forward to supporting RCC with data review in the future.

Sincerely,
Innovative Technical Solutions, Inc.

Evelyn H. Dawson
Senior Chemist

Enclosures:

Appendix A – List of Acronyms and Abbreviations
Appendix B – Qualified Report Pages
Appendix C – Qualified Results Table
Appendix D – ITSI Standard Legal Notice

cc: John Malusa
Golder Associates, Inc.
4730 North Oracle Road, Suite 210
Tucson, Arizona 85705

APPENDIX A

LIST OF ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS AND ABBREVIATIONS

As	arsenic
CCV	continuing calibration verification
COC	chain-of-custody
CRQL	contract required quantitation limit
Cu	copper
AES	atomic emission spectroscopy
EPA	U.S. Environmental Protection Agency
HHRA	Human Health Risk Assessment
ICP	inductively coupled plasma
ICV	initial calibration verification
ITSI	Innovative Technical Solutions, Inc.
LCS	laboratory control samples
mg/Kg	milligrams per kilogram
MS/MSD	matrix spike/matrix spike duplicate
Pb	lead
PQL	practical quantitation limit
QAPP	Quality Assurance Project Plan
QRT	qualified results table
RCC	Resolution Copper Company
RL	reporting limit
RPD	relative percent difference
SDG	Sample Delivery Group
SSCV	second source calibration verification
SVL	SVL Analytical

LIST OF VALUE FLAGS

J	estimated value

APPENDIX B

QUALIFIED REPORT PAGES

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

S611012

Lab Name: SVL_ANALYTICAL_INC._____ Contract: _____
Lab Code: SVL____ Case No: _____ SAS No: _____ SDG No: 132006_____
Matrix (soil/water): SOIL_ Lab Sample ID: S611012
Level (low/med): LOW__ Date Received: 03/05/08
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	64.3			P
7440-50-8	Copper	865		J	P
7439-92-1	Lead	87.9			P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID: NMF-07HHRA-003
SAMPLE_SIEVED_-60_MESH_PRIOR_TO_ANALYSIS
PERCENT_SOLIDS_NOT_APPLICABLE

PC ITS1
4/3/08

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE NO.

S611026

Lab Name: SVL_ANALYTICAL_INC._____ Contract: _____
Lab Code: SVL___ Case No: _____ SAS No: _____ SDG No: 132006_____
Matrix (soil/water): SOIL_ Lab Sample ID: S611026
Level (low/med): LOW__ Date Received: 03/05/08
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	82.2			P
7440-50-8	Copper	1250		J	P
7439-92-1	Lead	110			P

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID: BFD-3
SAMPLE_SIEVED_-60_MESH_PRIOR_TO_ANALYSIS
PERCENT_SOLIDS_NOT_APPLICABLE

PC ITI
4/3/08

APPENDIX C

QUALIFIED RESULTS TABLE

Qualified Results Table for
Resolution Copper
HHRA Resolution
SDGs 132004, 132005 and 132006
February 2008 Soil Sampling

Sample	SDG	Lab ID	Type	Parameter	Original Value	Added Qualifier	New Value	Units	Reason	Method	Validator
NMF-07HHRA-003	132006	S611012	Soil	Copper	865	J	865 J	mg/kg	Field Duplicate RPD	EPA 6010B	ITSI/PC
BFD-3	132006	S611026	Soil	Copper	1250	J	1250 J	mg/kg	Field Duplicate RPD	EPA 6010B	ITSI/PC

Abbreviations

mg/kg = micrograms per kilogram
RPD = Relative Percent Difference
SDG = Sample Delivery Group

Data Qualifier Flags

J = estimated value

APPENDIX D

ITSI STANDARD LEGAL NOTICE

ITSI STANDARD LEGAL NOTICE

ITSI is issuing this report at the request of the Client and based upon information furnished by Client. Further, the presence of environmental contamination can be influenced by many factors, including unknown and changing underground conditions. Therefore: 1. This report may not be relied upon by anyone for financial decision-making. 2. No one other than Client is authorized to use this report for any purpose. 3. Any conclusions or opinions included in this report are subject to reasonable revision based upon any new environmental or other data which is later developed. 4. Any results or conclusions stated are to be considered limited by the quality of the underlying sample or other data on which they are based, the budget established by the Client or otherwise for gathering and analyzing data, and by any assumptions and qualifications contained within this report.

APPENDIX B
SUMMARY OF GOLDER APRIL 2008 TEST PIT SAMPLING EVENT
ON CD

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802116 **Method Type:** **SOW No.:** SW-846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802116-01	RAWTP-11 2"-1'	
W802116-02	RAWTP-11 1'-2'	
W802116-03	RAWTP-11 2'-3'	
W802116-04	RAWTP-13 2"-1'	
W802116-05	RAWTP-13 1'-2'	
W802116-06	RAWTP-13 2'-3'	
W802116-07	RAWTP-13 3'-4'	
W802116-08	RAWTP-21 2"-1'	
W802116-09	RAWTP-21 1'-2'	
W802116-10	RAWTP-21 2'-3'	
W802116-11	RAWTP-20 2"-1'	
W802116-12	RAWTP-20 1'-2'	
W802116-13	RAWTP-20 2'-3'	
W802116-14	RAWTP-20 3'-4'	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802116 **Method Type:** **SOW No.:** SW-846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802116-15	BFD-12	
W820105-MS1	RAWTP-11 2"-1'MS	Matrix Spike
W820105-MSD1	RAWTP-11 2"-1'MSD	Matrix Spike Duplicate

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-15 **Client ID:** BFD-12

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	17.5	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	114	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	20.1	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-02 **Client ID:** RAWTP-11 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	28.9	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	773	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	17.8	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-01 **Client ID:** RAWTP-11 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	62.5	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	1650	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	34.0	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-03 **Client ID:** RAWTP-11 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	29.2	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	705	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	20.5	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-05 **Client ID:** RAWTP-13 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	11.0	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	83.0	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	35.6	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-04 **Client ID:** RAWTP-13 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	24.2	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	284	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	27.3	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-06 **Client ID:** RAWTP-13 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	8.4	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	52.1	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	36.8	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-07 **Client ID:** RAWTP-13 3'-4'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	9.3	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	60.9	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	38.7	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-12 **Client ID:** RAWTP-20 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	39.0	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	227	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	25.8	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-11 **Client ID:** RAWTP-20 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	188	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	910	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	61.4	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-13 **Client ID:** RAWTP-20 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	5.6	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	63.0	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	5.8	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-14 **Client ID:** RAWTP-20 3'-4'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	12.4	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	88.0	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	15.8	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-09 **Client ID:** RAWTP-21 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	30.9	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	262	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	23.6	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-08 **Client ID:** RAWTP-21 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	72.9	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	517	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	36.8	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802116 **Method Type:**

Sample ID: W802116-10 **Client ID:** RAWTP-21 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	44.0	mg/Kg			P	0.71	OPTIMA7	W820105
7440-50-8	Copper	381	mg/Kg			P	0.29	OPTIMA7	W820105
7439-92-1	Lead	35.8	mg/Kg			P	0.23	OPTIMA7	W820105

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802116
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV					**Source:** 08E0067				
	Arsenic	2045.81	2000.0	102	90.0 - 110.0	P	5/19/2008	07:43	W820105
	Copper	1987.07	2000.0	99	90.0 - 110.0	P	5/19/2008	07:43	W820105
	Lead	2018.08	2000.0	101	90.0 - 110.0	P	5/19/2008	07:43	W820105
CCV					**Source:** 08E0067				
	Arsenic	2148.10	2000.0	107	90.0 - 110.0	P	5/19/2008	08:09	W820105
	Copper	2052.69	2000.0	103	90.0 - 110.0	P	5/19/2008	08:09	W820105
	Lead	2089.14	2000.0	104	90.0 - 110.0	P	5/19/2008	08:09	W820105
CCV					**Source:** 08E0067				
	Arsenic	2141.89	2000.0	107	90.0 - 110.0	P	5/19/2008	09:21	W820105
	Copper	2041.18	2000.0	102	90.0 - 110.0	P	5/19/2008	09:21	W820105
	Lead	2074.61	2000.0	104	90.0 - 110.0	P	5/19/2008	09:21	W820105
CCV					**Source:** 08E0067				
	Arsenic	2161.07	2000.0	108	90.0 - 110.0	P	5/19/2008	10:20	W820105
	Copper	2044.39	2000.0	102	90.0 - 110.0	P	5/19/2008	10:20	W820105
	Lead	2099.06	2000.0	105	90.0 - 110.0	P	5/19/2008	10:20	W820105

- 2b -
CRDL STANDARD FOR AA & ICP

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Advisory Limits (%R)	M	Analysis Date	Analysis Time	Run Number
CRI					**Source:** 08E0089				
	Arsenic	28.91	25.0	116	70 - 130	P	5/19/2008	07:53	W820105
	Copper	9.64	10.0	96	70 - 130	P	5/19/2008	07:53	W820105
	Lead	7.74	7.5	103	50 - 150	P	5/19/2008	07:53	W820105

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/19/2008	07:47	W820105
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/19/2008	07:47	W820105
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/19/2008	07:47	W820105
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/19/2008	08:14	W820105
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/19/2008	08:14	W820105
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/19/2008	08:14	W820105
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/19/2008	09:25	W820105
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/19/2008	09:25	W820105
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/19/2008	09:25	W820105
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/19/2008	10:24	W820105
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/19/2008	10:24	W820105
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/19/2008	10:24	W820105

- 3b -
PREPARATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result (mg/Kg)	Conc Qual	Q	Acceptance Limit	MDL	PQL	M	Analysis Date	Analysis Time	Run
PBS			**SOIL**								
	Arsenic	0.710U			+/-0.710	0.710	2.500	P	5/19/2008	08:26	W820105
	Copper	0.290U			+/-0.290	0.290	1.000	P	5/19/2008	08:26	W820105
	Lead	-0.271J			+/-0.230	0.230	0.750	P	5/19/2008	08:26	W820105

- 4 -

INTERFERENCE CHECK SAMPLE

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window	Analysis Date	Analysis Time	Run Number
ICSA					**Source:** 08E0109/08E0110			
	Arsenic	9.2				5/19/2008	07:58	W820105
	Copper	10800	10000	108	80 - 120%	5/19/2008	07:58	W820105
	Lead	15.5				5/19/2008	07:58	W820105
ICSAB					**Source:** 08E0109/08E0110			
	Arsenic	529	500	106	80 - 120%	5/19/2008	08:04	W820105
	Copper	531	500	106	80 - 120%	5/19/2008	08:04	W820105
	Lead	474	500	95	80 - 120%	5/19/2008	08:04	W820105

- 5a -

MATRIX SPIKE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802116-01 **Client ID:** RAWTP-11 2"-1'MS

Percent Solids for Sample: 100.00 **Spiked ID:** W820105-MS1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	173.2470		62.4915		100.00	111		P
Copper	mg/Kg	75 - 125	1976.9540		1647.0270		100.00	330		P
Lead	mg/Kg	75 - 125	132.1379		34.0185		100.00	98		P

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802116-01 **Client ID:** RAWTP-11 2"-1'MSD

Percent Solids for Sample: 100.00 **Spiked ID:** W820105-MSD1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	169.7902		62.4915		100.00	107		P
Copper	mg/Kg	75 - 125	1764.9110		1647.0270		100.00	118		P
Lead	mg/Kg	75 - 125	132.2601		34.0185		100.00	98		P

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W820105-MS1 **Client ID:** RAWTP-11 2"-1'MSD

Percent Solids for Sample: 100.00 **Duplicate ID:** W820105-MSD1 **Percent Solids for Duplicate:** 100.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	mg/Kg		173.2470		169.7902		2		P
Copper	mg/Kg		1976.9540		1764.9110		11		P
Lead	mg/Kg		132.1379		132.2601		0		P

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSS			**LCS Source:**	**QC19115SCSN**			**Batch Number:**	**3050B-05152**
	Arsenic	mg/Kg	100.0	100.0		100	80.0 - 120.0	P
	Copper	mg/Kg	100.0	103.3		103	80.0 - 120.0	P
	Lead	mg/Kg	100.0	100.2		100	80.0 - 120.0	P

- 10 -
METHOD DETECTION LIMITS

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Analyte	Wave- length (nm)	MDL	PQL
OPTIMA7			**Date:** 3/20/2008
OPT7 GOLDER			
		ug/L	**ug/L**
Arsenic Water	188.979	8.8	25
Copper Water	324.752	5.8	10
Lead Water	220.353	2.7	7.5
		mg/Kg	**mg/Kg**
Arsenic Soil	188.979	7.1	25
Copper Soil	324.752	2.9	10
Lead Soil	220.353	2.3	7.5

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	Ag
Aluminum	308.22	0.0000000	0.0207190	0.0120300	-0.0515205	-4.9158802
Antimony	206.84	-0.0267947	-0.0235140	-0.0652917	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0026736	0.0617380	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0064810	-0.0021755	0.1105640	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0086530	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0128574	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0136640	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0719449	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.3618530	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0463195	0.0339874	0.0000000
Nickel	232.00	-0.0108972	-0.0086700	-0.2357930	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0671620	0.0000000	-0.0735814	0.0000000	0.0000000
Silver	328.07	0.0080000	0.0026432	-0.0431800	-0.0009512	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0159040	-0.0255790	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0196000	0.0000000	0.0000000
Zinc	206.20	0.0147479	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: As	B	Be	Cd	Co
Aluminum	308.22	-0.7712260	0.0000000	1.9230000	0.0000000	-8.4645996
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	-0.0452534
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0061070	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	-0.3502000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	2.2788999
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.6054300
Nickel	232.00	0.0000000	0.0000000	-0.4082000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	-0.0666463	0.0000000	0.0000000	-0.0206171
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	4.5946798
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.2605720	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Cr	Cu	Li	Mn	Mo
Aluminum	308.22	0.0000000	0.5861200	0.2252000	0.5555770	20.0904007
Antimony	206.84	5.5828600	0.0000000	0.0000000	0.0000000	-3.6831999
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	-0.1127460	0.0000000	0.0000000	0.0218515	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0613697
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	1.5008000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	-1.6574301
Cobalt	228.62	-0.1267530	0.0000000	0.0000000	0.0706386	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.5458750
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	-2.2182000	0.3641500	0.0000000	0.0915702	-0.2396000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	-1.5451100	0.0000000
Manganese	260.57	-0.1219760	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	13.8179998	-0.3078670	0.0000000	0.2056650	3.0824201
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	1.2911400	0.0000000
Silver	328.07	0.0000000	0.0327636	-0.0306730	0.1590960	0.0713769
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.3364670	0.0000000	0.0000000	-1.7416400	-0.5289330
Vanadium	292.40	-4.4160600	-0.0520540	0.0000000	-0.1773900	-0.4541660
Zinc	206.20	-1.5611300	0.0000000	0.0000000	0.3653180	0.8787460

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Na	Ni	Pb	Sb	Se
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0476335	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0648597	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.1080310	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.1204100	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	-0.2269880	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0048533	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.6535250	0.3507140

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Si	Sn	Sr	Ti	Tl
Aluminum	308.22	0.0000000	0.0000000	-3.8224199	2.0929599	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.5032240	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.1360430	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.1393840	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	2.0177901	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	-0.7596230	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	-0.0080177	-0.0100551	-0.0782215	0.0000000	-0.0094611
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	-1.9865000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.7094510	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.2964610

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: U	V	Zn	La	
Aluminum	308.22	-8.4760399	-10.4483004	-0.3308580	0.1640000	
Antimony	206.84	-1.1049000	0.0000000	0.0000000	0.0000000	
Arsenic	188.98	0.0000000	0.0000000	0.0000000	55.5082016	
Barium	233.53	-0.0388368	0.1318340	0.0000000	0.0000000	
Beryllium	313.11	-0.0741906	0.0000000	0.0000000	0.0000000	
Cadmium	226.50	-0.0501594	0.0000000	0.0000000	-0.1327000	
Calcium	315.89	2.6055901	-3.5826399	0.0000000	0.0000000	
Chromium	267.72	-1.0719800	0.1526560	0.0000000	0.0000000	
Cobalt	228.62	0.1274260	0.0000000	0.0000000	0.0000000	
Copper	324.75	0.5231330	-0.2011560	0.0000000	0.0000000	
Iron	273.96	-1.1845200	4.1059599	0.0000000	0.0000000	
Lead	220.35	1.2635400	0.0000000	0.0000000	0.4454000	
Magnesium	279.08	-12.8909998	0.0000000	0.0000000	0.0000000	
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	
Nickel	232.00	0.0000000	0.0000000	0.1456010	-20.4916000	
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	
Selenium	196.03	0.0000000	0.0000000	0.0000000	-4.0792599	
Silver	328.07	0.7184970	-0.1259390	0.0000000	-0.0451447	
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	
Thallium	190.80	0.0000000	2.5700600	0.0000000	0.0000000	
Vanadium	292.40	-1.5207601	0.0000000	0.0000000	0.9598270	
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 3/19/2008

Analyte	Integration Time (sec)	LDR ug/L	
Arsenic	20.00	50000	OPT7 GOLDER
Copper	20.00	90000	OPT7 GOLDER
Lead	20.00	100000	OPT7 GOLDER

- 13 -
SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802116

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number: 3050B-05152008	**Method:** P						
PBS	PBS	MB	SOIL	5/15/08	1.00	100.0	100.00
LCSS	LCSS	LCS	SOIL	5/15/08	1.00	100.0	100.00
W802116-01	RAWTP-11 2"-1'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W820105-MS1	RAWTP-11 2"-1'MS	MS	SOIL	5/15/08	1.00	100.0	100.00
W820105-MSD1	RAWTP-11 2"-1'MSD	MSD	SOIL	5/15/08	1.00	100.0	100.00
W802116-02	RAWTP-11 1'-2'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802116-03	RAWTP-11 2'-3'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802116-04	RAWTP-13 2"-1'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802116-05	RAWTP-13 1'-2'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802116-06	RAWTP-13 2'-3'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802116-07	RAWTP-13 3'-4'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802116-08	RAWTP-21 2"-1'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802116-09	RAWTP-21 1'-2'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802116-10	RAWTP-21 2'-3'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802116-11	RAWTP-20 2"-1'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802116-12	RAWTP-20 1'-2'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802116-13	RAWTP-20 2'-3'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802116-14	RAWTP-20 3'-4'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802116-15	BFD-12	SAM	SOIL	5/15/08	1.00	100.0	100.00

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802116

Instrument ID Number: OPTIMA7 Method: P Run Number: W820105

Start Date: 5/19/2008 End Date: 5/19/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.00	0715				X							X		X												
STD1	1.00	0720				X							X		X												
STD2	1.00	0726																									
STD3	1.00	0730																									
STD4	1.00	0735																									
STD5	1.00	0738																									
ICV	1.00	0743				X							X		X												
ICB	1.00	0747				X							X		X												
CRI	1.00	0753				X							X		X												
ICSA	1.00	0758				X							X		X												
ICSAB	1.00	0804				X							X		X												
CCV	1.00	0809				X							X		X												
CCB	1.00	0814				X							X		X												
PBS	1.00	0826				X							X		X												
LCSS	1.00	0832				X							X		X												
RAWTP-11 2"-1'	1.00	0837				X							X		X												
RAWTP-11 2"-1'MS	1.00	0842				X							X		X												
RAWTP-11 2"-1'MSD	1.00	0848				X							X		X												
RAWTP-11 1'-2'	1.00	0853				X							X		X												
RAWTP-11 2'-3'	1.00	0859				X							X		X												
RAWTP-13 2"-1'	1.00	0904				X							X		X												
RAWTP-13 1'-2'	1.00	0910				X							X		X												
RAWTP-13 2'-3'	1.00	0915				X							X		X												
CCV	1.00	0921				X							X		X												
CCB	1.00	0925				X							X		X												
RAWTP-13 3'-4'	1.00	0931				X							X		X												
RAWTP-21 2"-1'	1.00	0936				X							X		X												
RAWTP-21 1'-2'	1.00	0942				X							X		X												
RAWTP-21 2'-3'	1.00	0947				X							X		X												
RAWTP-20 2"-1'	1.00	0952				X							X		X												
RAWTP-20 1'-2'	1.00	0958				X							X		X												
RAWTP-20 2'-3'	1.00	1003				X							X		X												
RAWTP-20 3'-4'	1.00	1009				X							X		X												
BFD-12	1.00	1014				X							X		X												
CCV	1.00	1020				X							X		X												
CCB	1.00	1024				X							X		X												

October 07, 2011

Dr. Casey McKeon
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

RE: ITSI DATA VALIDATION REPORT
RESOLUTION COPPER MINING
HUMAN HEALTH RISK ASSESSMENT
SDG W802116

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) has completed the data review for Resolution Copper Mining (RCM) for its Human Health Risk Assessment (HHRA) soil samples collected in 2008. ITSI performed data review as described in the U.S. Environmental Protection Agency's (EPA) *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004; and the *Sampling and Analysis Plan (SAP) for Clean Closure at Resolution Copper Mining Limited (Resolution), West Plant Site, Superior Mine* , (Golder, June 2005).

The acronym and abbreviations list is included as Appendix A. A summary of the field duplicate pair results is provided in the Field Duplicate Table as Appendix B. Client communications are provided as Appendix C. The ITSI standard legal notice is provided as Appendix D.

1.0 CROSS REFERENCE OF SAMPLES VERIFIED

The analytical data presented in the laboratory Sample Delivery Group (SDG) listed in Table 1 underwent an EPA Level III data validation. The Level III data validation is equivalent to a Step 2A validation, manual (S2AVM) as defined in the *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009). The SDGs contained data for arsenic, copper and lead by EPA Method 6010B. The primary analytical laboratory was SVL of Kellogg, Idaho. Table 1 below provides an analytical summary and cross reference for the samples.

1501 West Fountainhead Parkway, Suite 350
Tempe, Arizona 85282

(480) 706-6488
fax (480) 704-2952
www.itsi.com

Table 1 Analytical Summary and Cross Reference for Method 6010B

Client Sample ID	Laboratory SDG Number	Date Sampled	QC Samples
RAWTP-11 2"-1'	W802116-01	5/1/2008	MS/MSD
RAWTP-11 1'-2'	W802116-02	5/1/2008	
RAWTP-11 2'-3'	W802116-03	5/1/2008	
RAWTP-13 2"-1'	W802116-04	5/1/2008	
RAWTP-13 1'-2'	W802116-05	5/1/2008	
RAWTP-13 2'-3'	W802116-06	5/1/2008	
RAWTP-13 3'-4'	W802116-07	5/1/2008	
RAWTP-21 2"-1'	W802116-08	5/1/2008	
RAWTP-21 1'-2'	W802116-09	5/1/2008	
RAWTP-21 2'-3'	W802116-10	5/1/2008	
RAWTP-20 2"-1'	W802116-11	5/1/2008	
RAWTP-20 1'-2'	W802116-12	5/1/2008	
RAWTP-20 2'-3'	W802116-13	5/1/2008	
RAWTP-20 3'-4'	W802116-14	5/1/2008	PS
BFD-12	W802116-15	5/1/2008	FD

FD = Field duplicate sample
MS/MSD = Matrix spike/matrix spike duplicate
PS = Parent sample of field duplicate

The EPA S2AVM data validation included review of the report from the laboratory equivalent to an abbreviated EPA Level III data deliverable with standardized EPA forms. Level III data deliverables contain the sample results and chain-of-custody forms along with basic Quality Control (QC) summaries including surrogate recoveries, method blank results, and precision and accuracy data summaries for the sample preparation batch. As discussed in Section 2.0 below, the laboratory did not include any comments in the case narrative addressing any QC problems.

2.0 LABORATORY REPORT

The data were reported by the laboratory as an EPA Level III deliverable with standardized EPA forms. The data qualifiers noted by the laboratory in the report were reviewed. Anomalies that required data qualification, if any, are discussed in the sections below. Since the laboratory did not include a case narrative in the report, only the quality control anomalies from the Level III data deliverable could be addressed. Also, there was no official laboratory signature authorizing the release of the report or issue date. ITSI advises that all laboratory reports received by the client contain an official signature authorizing the release of the report and that the issue date should be documented on the report. In addition, the laboratory should provide an officially signed report for the data

in this SDG indicating the original and revised issue dates that attest to the validity of the data.

3.0 SAMPLE INTEGRITY

The Chains-of-Custody (COC) for the May 01, 2008 sampling event were available for review. There were no anomalies that required qualification of the data, however, the following COC anomaly was observed.

- The transfer of the samples to the shipping carrier was not documented on the COC. The client indicated that the samplers shipped the samples to SVL via FedEx. ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number. A copy of the communication with the client verifying the transfer of samples to FedEx is provided in Appendix F.

4.0 HOLDING TIME

The samples were analyzed within the recommended method holding time of 180 days after collection.

5.0 INITIAL AND CONTINUING CALIBRATION

The initial and continuing calibrations were not reviewed for this level of validation.

6.0 BLANK EVALUATION

Preparation and equipment blanks were reviewed. The equipment blank(s) associated with the samples are listed in the Data Validation Report (DVR) for SDG W802216. There were no compounds detected in any of the blanks that required qualification of the data.

7.0 LABORATORY CONTROL SAMPLE

A laboratory control sample (LCS) was reported for each analysis. QC results were reviewed using the control limits listed in Table C6 of the SAP. There were no LCS anomalies that required qualification of the data.

8.0 MATRIX SPIKE AND MATRIX SPIKE DUPLICATE

The project matrix spike/matrix spike duplicate (MS/MSD) pair was reviewed using the laboratory control limits of 75 to 125 percent for accuracy and 20 relative percent difference (RPD) for precision. The sample used as the MS/MSD pair is identified in Table 1. There were no MS/MSD anomalies that required qualification of the data.

9.0 REPORTING LIMIT SPIKES

Spikes prepared at the laboratory's reporting limit were reviewed. There were no reporting limit spike anomalies that required qualification of the data.

10.0 COMPOUND QUANTITATION AND IDENTIFICATION

The laboratory reporting limits and quantitative results were reviewed. All reporting limits met the Client Required Detection Limits (CRDLs) listed in the SAP. There were no quantitative anomalies that required qualification of the data, however, the following observation was made.

- There were no units listed on reporting Form 10 for the instrument method detection limits (MDLs) and practical quantitation limits (PQLs) provided with the data package. To provide traceability of laboratory reporting limits from the instrument to the reported data, the laboratory is advised to list the MDL and PQL units on all reporting forms.

11.0 FIELD DUPLICATE SAMPLES

A field duplicate set was collected and analyzed to measure field and laboratory precision. The results of the field duplicate and parent samples were compared and are summarized in the Field Duplicate Table presented as Appendix D. All field duplicate results were acceptable.

12.0 RECOMMENDATIONS

ITSI recommends the following actions.

- ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number.

- ITSI advises that all laboratory reports must contain an official signature authorizing the release of the report and that the issue date be documented on the report. Also, the laboratory should provide a properly signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

- ITSI advises the laboratory to list the MDL and PQL units on all reporting forms to provide traceability of laboratory reporting limits from the instrument to the reported data.

13.0 OVERALL ASSESSMENT FOR RCM HHRA MAY 15, 2011 SAMPLING EVENT

There were no rejected results for this sampling event. Based on the available information, the data are considered useable for their intended purposes.

We thank you for the opportunity to serve you and look forward to supporting RCM with data review in the future.

Sincerely,

Innovative Technical Solutions, Inc.

Evelyn Dawson, CHMM

Program Chemist

Enclosures:

Appendix A – List of Acronyms and Abbreviations
Appendix B – Field Duplicate Table
Appendix C – Client Communication
Appendix D – ITSI Standard Legal Notice

cc: John Malusa
Golder Associates, Inc.
4730 North Oracle Road, Suite 210
Tucson, Arizona, 85705

APPENDIX A

LIST OF ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS AND ABBREVIATIONS

COC	chain-of-custody
CRDL	Client Required Detection Limits
EPA	U.S. Environmental Protection Agency
FD	field duplicate
HHRA	Human Health Risk Assessment
ITSI	Innovative Technical Solutions, Inc.
LCS	laboratory control spike
MDL	method detection limits
MS/MSD	matrix spike/matrix spike duplicate
PQL	practical quantitation limits
PS	parent sample
QC	quality control
QRT	Qualified Results Table
RPD	relative percent difference
RCM	Resolution Copper Mining
SAP	Sample Analysis Plan
S2AVM	Step 2A validation, manual
SDG	Sample Delivery Group

APPENDIX B

FIELD DUPLICATE TABLE

FIELD DUPLICATE RESULTS
RESOLUTION COPPER MINING
HUMAN HEALTH RISK ASSESSMENT

Client ID Primary/FD	Laboratory ID Primary/FD	Metal	Sample mg/kg	Duplicate mg/kg	RPD	Agreement (Yes) Non-agreement (No)
RAWTP-20 3'-4' / BFD-12	W802116-14 / 15	Arsenic	12.4	17.5	34%	Yes
RAWTP-20 3'-4' / BFD-12	W802116-14 / 15	Lead	15.8	20.1	24%	Yes
RAWTP-20 3'-4' / BFD-12	W802116-14 / 15	Copper	88	114	26%	Yes

Notes
mg/kg = milligrams per kilogram
FD = field duplicate
Yes = RPD less than control limit of 35
RPD = relative percent difference

APPENDIX C

CLIENT COMMUNICATION

Peggy Cota

From: Morfin, Orestes <Orestes_Morfin@golder.com>
Sent: Tuesday, September 27, 2011 1:52 PM
To: Peggy Cota; Evelyn Dawson
Cc: Malusa, John
Subject: 2008 RAWTP sample shipping

Hello Peggy and Evelyn,
I received an e-mail today from Alejandra Bonilla, one of the two field crew who collected the 2008 RAWTP samples. She confirmed that the samples were shipped to SVL via FedEx.
I hope that helps.
Sincerely,
Orestes

Orestes Morfín (M.Sc.)| Project Hydrogeochemist | **Golder Associates Ltd.**
102, 2535 - 3rd Avenue S.E., Calgary, Alberta, Canada T2A 7W5
T: +1 (403) 299 5600 | **D:** +1 403 513-3574 | **F:** +1 (403) 299-5606 | **C:** +1 | **E:** Orestes_Morfin@golder.com | **www.golder.com**

Work Safe, Home Safe

APPENDIX D

ITSI STANDARD LEGAL NOTICE

ITSI STANDARD LEGAL NOTICE

ITSI is issuing this report at the request of the Client and based upon information furnished by Client. Further, the presence of environmental contamination can be influenced by many factors, including unknown and changing underground conditions. Therefore: 1. This report may not be relied upon by anyone for financial decision-making. 2. No one other than Client is authorized to use this report for any purpose. 3. Any conclusions or opinions included in this report are subject to reasonable revision based upon any new environmental or other data which is later developed. 4. Any results or conclusions stated are to be considered limited by the quality of the underlying sample or other data on which they are based, the budget established by the Client or otherwise for gathering and analyzing data, and by any assumptions and qualifications contained within this report.

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802119 **Method Type:** **SOW No.:** SW-846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802119-01	RAWTP-01 0-2"	
W802119-02	RAWTP-02 0-2"	
W802119-03	RAWTP-03 0-2"	
W802119-04	RAWTP-04 0-2"	
W802119-05	RAWTP-05 0-2"	
W802119-06	RAWTP-06 0-2"	
W802119-07	RAWTP-07 0-2"	
W802119-08	RAWTP-07 0-2"	
W802119-09	RAWTP-09 0-2"	
W802119-10	RAWTP-10 0-2"	
W802119-11	RAWTP-11 0-2"	
W802119-12	RAWTP-12 0-2"	
W802119-13	RAWTP-13 0-2"	
W802119-14	RAWTP-15 0-2"	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802119 **Method Type:** **SOW No.:** SW-846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802119-15	RAWTP-BFD-0-2"	
W820106-MS1	RAWTP-01 0-2"MS	Matrix Spike
W820106-MSD1	RAWTP-01 0-2"MSD	Matrix Spike Duplicate

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-01 **Client ID:** RAWTP-01 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	138	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	3010	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	134	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-02 **Client ID:** RAWTP-02 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	166	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	9050	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	192	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-03 **Client ID:** RAWTP-03 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	2110	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	40900	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	918	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-04 **Client ID:** RAWTP-04 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	2090	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	90600	mg/Kg		D	P	5.8	OPTIMA7	W820106A
7439-92-1	Lead	920	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-05 **Client ID:** RAWTP-05 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	66.9	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	1540	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	63.2	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-06 **Client ID:** RAWTP-06 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	899	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	35000	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	620	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-07 **Client ID:** RAWTP-07 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	59.0	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	2730	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	69.9	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-08 **Client ID:** RAWTP-08 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	117	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	5850	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	95.1	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-09 **Client ID:** RAWTP-09 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	1430	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	32600	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	715	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-10 **Client ID:** RAWTP-10 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	1340	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	33000	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	481	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-11 **Client ID:** RAWTP-11 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	2100	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	47700	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	808	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-12 **Client ID:** RAWTP-12 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	1600	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	29700	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	745	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-13 **Client ID:** RAWTP-13 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	92.9	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	954	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	72.1	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-14 **Client ID:** RAWTP-15 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	713	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	1640	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	291	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802119 **Method Type:**

Sample ID: W802119-15 **Client ID:** RAWTP-BFD-0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	1930	mg/Kg		D	P	7.1	OPTIMA7	W820106
7440-50-8	Copper	38500	mg/Kg		D	P	2.9	OPTIMA7	W820106
7439-92-1	Lead	606	mg/Kg		D	P	2.3	OPTIMA7	W820106

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802119
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV					**Source:** 08E0067				
	Arsenic	2088.94	2000.0	104	90.0 - 110.0	P	5/18/2008	15:40	W820106
	Copper	2034.89	2000.0	102	90.0 - 110.0	P	5/18/2008	15:40	W820106
	Lead	2063.76	2000.0	103	90.0 - 110.0	P	5/18/2008	15:40	W820106
CCV					**Source:** 08E0067				
	Arsenic	2055.12	2000.0	103	90.0 - 110.0	P	5/18/2008	16:07	W820106
	Copper	1965.90	2000.0	98	90.0 - 110.0	P	5/18/2008	16:07	W820106
	Lead	2033.28	2000.0	102	90.0 - 110.0	P	5/18/2008	16:07	W820106
CCV					**Source:** 08E0067				
	Arsenic	2071.25	2000.0	104	90.0 - 110.0	P	5/18/2008	17:14	W820106
	Copper	2006.71	2000.0	100	90.0 - 110.0	P	5/18/2008	17:14	W820106
	Lead	2026.62	2000.0	101	90.0 - 110.0	P	5/18/2008	17:14	W820106
CCV					**Source:** 08E0067				
	Arsenic	2130.53	2000.0	107	90.0 - 110.0	P	5/18/2008	18:25	W820106
	Copper	2057.03	2000.0	103	90.0 - 110.0	P	5/18/2008	18:25	W820106
	Lead	2070.96	2000.0	104	90.0 - 110.0	P	5/18/2008	18:25	W820106
ICV					**Source:** 08E0202				
	Copper	1961.13	2000.0	98	90.0 - 110.0	P	5/27/2008	07:48	W820106A
CCV					**Source:** 08E0202				
	Copper	1936.23	2000.0	97	90.0 - 110.0	P	5/27/2008	08:25	W820106A
CCV					**Source:** 08E0202				
	Copper	1960.29	2000.0	98	90.0 - 110.0	P	5/27/2008	08:47	W820106A

- 2b -
CRDL STANDARD FOR AA & ICP

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Advisory Limits (%R)	M	Analysis Date	Analysis Time	Run Number
CRI					**Source:** 08E0089				
	Arsenic	28.83	25.0	115	50 - 150	P	5/18/2008	15:50	W820106
	Copper	8.31	10.0	83	50 - 150	P	5/18/2008	15:50	W820106
	Lead	8.45	7.5	113	50 - 150	P	5/18/2008	15:50	W820106
CRI					**Source:** 08E0214				
	Copper	8.16	10.0	82	50 - 150	P	5/27/2008	07:59	W820106A

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/18/2008	15:45	W820106
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/18/2008	15:45	W820106
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/18/2008	15:45	W820106
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/18/2008	16:13	W820106
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/18/2008	16:13	W820106
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/18/2008	16:13	W820106
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/18/2008	17:19	W820106
	Copper	5.840	+/-10.000	J	5.800	10.000	P	5/18/2008	17:19	W820106
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/18/2008	17:19	W820106
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/18/2008	17:30	W820106
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/18/2008	17:30	W820106
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/18/2008	17:30	W820106
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/18/2008	18:30	W820106
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/18/2008	18:30	W820106
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/18/2008	18:30	W820106
ICB										
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/27/2008	07:54	W820106A
CCB										
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/27/2008	08:31	W820106A
CCB										
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/27/2008	08:53	W820106A

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run

- 3b -
PREPARATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result (mg/Kg)	Conc Qual	Q	Acceptance Limit	MDL	PQL	M	Analysis Date	Analysis Time	Run
PBS			**SOIL**								
	Arsenic	0.710U			+/-0.710	0.710	2.500	P	5/18/2008	16:19	W820106
	Copper	0.290U			+/-0.290	0.290	1.000	P	5/18/2008	16:19	W820106
	Lead	0.230U			+/-0.230	0.230	0.750	P	5/18/2008	16:19	W820106

- 4 -
INTERFERENCE CHECK SAMPLE

Client: GOLDER ASSOCIATES **SDG No.:** W802119
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**
Instrument ID: OPTIMA7

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window	Analysis Date	Analysis Time	Run Number
ICSA					**Source:** 08E0109/08E0110			
	Arsenic	8.9				5/18/2008	15:56	W820106
	Copper	10800	10000	108	80 - 120%	5/18/2008	15:56	W820106
	Lead	16.7				5/18/2008	15:56	W820106
ICSAB					**Source:** 08E0109/08E0110			
	Arsenic	514	500	103	80 - 120%	5/18/2008	16:02	W820106
	Copper	514	500	103	80 - 120%	5/18/2008	16:02	W820106
	Lead	466	500	93	80 - 120%	5/18/2008	16:02	W820106
ICSA					**Source:** 08E0215/08E0216			
	Copper	10100	10000	101	80 - 120%	5/27/2008	08:05	W820106A
ICSAB					**Source:** 08E0215/08E0216			
	Copper	495	500	99	80 - 120%	5/27/2008	08:11	W820106A
ICSAB					**Source:** 08E0215/08E0216			
	Copper	502	500	100	80 - 120%	5/27/2008	08:19	W820106A

- 5a -

MATRIX SPIKE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802119-01 **Client ID:** RAWTP-01 0-2"MS

Percent Solids for Sample: 100.00 **Spiked ID:** W820106-MS1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	255.9722		138.0379		100.00	118		P
Copper	mg/Kg	75 - 125	3165.9830		3010.1290		100.00	156		P
Lead	mg/Kg	75 - 125	240.1564		133.7748		100.00	106		P

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802119-01 **Client ID:** RAWTP-01 0-2"MSD

Percent Solids for Sample: 100.00 **Spiked ID:** W820106-MSD1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	245.8042		138.0379		100.00	108		P
Copper	mg/Kg	75 - 125	3199.1150		3010.1290		100.00	189		P
Lead	mg/Kg	75 - 125	240.4103		133.7748		100.00	107		P

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W820106-MS1 **Client ID:** RAWTP-01 0-2"MSD

Percent Solids for Sample: 100.00 **Duplicate ID:** W820106-MSD1 **Percent Solids for Duplicate:** 100.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	mg/Kg		255.9722		245.8042		4		P
Copper	mg/Kg		3165.9830		3199.1150		1		P
Lead	mg/Kg		240.1564		240.4103		0		P

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSS			**LCS Source:**	**QC19115SCSN**			**Batch Number:**	**3050B-05152**
	Arsenic	mg/Kg	100.0	97.3		97	80.0 - 120.0	P
	Copper	mg/Kg	100.0	101.0		101	80.0 - 120.0	P
	Lead	mg/Kg	100.0	98.5		98	80.0 - 120.0	P

- 10 -
METHOD DETECTION LIMITS

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Analyte	Wave- length (nm)	MDL	PQL
OPTIMA7			**Date:** 3/20/2008
OPT7 GOLDER			
		ug/L	**ug/L**
Arsenic Water	188.979	8.8	25
Copper Water	324.752	5.8	10
Lead Water	220.353	2.7	7.5
		mg/Kg	**mg/Kg**
Arsenic Soil	188.979	7.1	25
Copper Soil	324.752	2.9	10
Lead Soil	220.353	2.3	7.5

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	Ag
Aluminum	308.22	0.0000000	0.0207190	0.0120300	-0.0515205	-4.9158802
Antimony	206.84	-0.0267947	-0.0235140	-0.0652917	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0026736	0.0617380	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0064810	-0.0021755	0.1105640	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0086530	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0128574	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0136640	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0719449	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.3618530	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0463195	0.0339874	0.0000000
Nickel	232.00	-0.0108972	-0.0086700	-0.2357930	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0671620	0.0000000	-0.0735814	0.0000000	0.0000000
Silver	328.07	0.0080000	0.0026432	-0.0431800	-0.0009512	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0159040	-0.0255790	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0196000	0.0000000	0.0000000
Zinc	206.20	0.0147479	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: As	B	Be	Cd	Co
Aluminum	308.22	-0.7712260	0.0000000	1.9230000	0.0000000	-8.4645996
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	-0.0452534
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0061070	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	-0.3502000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	2.2788999
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.6054300
Nickel	232.00	0.0000000	0.0000000	-0.4082000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	-0.0666463	0.0000000	0.0000000	-0.0206171
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	4.5946798
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.2605720	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Cr	Cu	Li	Mn	Mo
Aluminum	308.22	0.0000000	0.5861200	0.2252000	0.5555770	20.0904007
Antimony	206.84	5.5828600	0.0000000	0.0000000	0.0000000	-3.6831999
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	-0.1127460	0.0000000	0.0000000	0.0218515	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0613697
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	1.5008000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	-1.6574301
Cobalt	228.62	-0.1267530	0.0000000	0.0000000	0.0706386	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.5458750
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	-2.2182000	0.3641500	0.0000000	0.0915702	-0.2396000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	-1.5451100	0.0000000
Manganese	260.57	-0.1219760	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	13.8179998	-0.3078670	0.0000000	0.2056650	3.0824201
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	1.2911400	0.0000000
Silver	328.07	0.0000000	0.0327636	-0.0306730	0.1590960	0.0713769
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.3364670	0.0000000	0.0000000	-1.7416400	-0.5289330
Vanadium	292.40	-4.4160600	-0.0520540	0.0000000	-0.1773900	-0.4541660
Zinc	206.20	-1.5611300	0.0000000	0.0000000	0.3653180	0.8787460

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Na	Ni	Pb	Sb	Se
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0476335	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0648597	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.1080310	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.1204100	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	-0.2269880	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0048533	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.6535250	0.3507140

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Si	Sn	Sr	Ti	Tl
Aluminum	308.22	0.0000000	0.0000000	-3.8224199	2.0929599	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.5032240	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.1360430	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.1393840	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	2.0177901	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	-0.7596230	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	-0.0080177	-0.0100551	-0.0782215	0.0000000	-0.0094611
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	-1.9865000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.7094510	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.2964610

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: U	V	Zn	La	
Aluminum	308.22	-8.4760399	-10.4483004	-0.3308580	0.1640000	
Antimony	206.84	-1.1049000	0.0000000	0.0000000	0.0000000	
Arsenic	188.98	0.0000000	0.0000000	0.0000000	55.5082016	
Barium	233.53	-0.0388368	0.1318340	0.0000000	0.0000000	
Beryllium	313.11	-0.0741906	0.0000000	0.0000000	0.0000000	
Cadmium	226.50	-0.0501594	0.0000000	0.0000000	-0.1327000	
Calcium	315.89	2.6055901	-3.5826399	0.0000000	0.0000000	
Chromium	267.72	-1.0719800	0.1526560	0.0000000	0.0000000	
Cobalt	228.62	0.1274260	0.0000000	0.0000000	0.0000000	
Copper	324.75	0.5231330	-0.2011560	0.0000000	0.0000000	
Iron	273.96	-1.1845200	4.1059599	0.0000000	0.0000000	
Lead	220.35	1.2635400	0.0000000	0.0000000	0.4454000	
Magnesium	279.08	-12.8909998	0.0000000	0.0000000	0.0000000	
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	
Nickel	232.00	0.0000000	0.0000000	0.1456010	-20.4916000	
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	
Selenium	196.03	0.0000000	0.0000000	0.0000000	-4.0792599	
Silver	328.07	0.7184970	-0.1259390	0.0000000	-0.0451447	
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	
Thallium	190.80	0.0000000	2.5700600	0.0000000	0.0000000	
Vanadium	292.40	-1.5207601	0.0000000	0.0000000	0.9598270	
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 3/19/2008

Analyte	Integration Time (sec)	LDR ug/L	
Arsenic	20.00	50000	OPT7 GOLDER
Copper	20.00	90000	OPT7 GOLDER
Lead	20.00	100000	OPT7 GOLDER

- 13 -
SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802119

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number: 3050B-05152008	**Method:** P						
PBS	PBS	MB	SOIL	5/15/08	1.00	100.0	100.00
LCSS	LCSS	LCS	SOIL	5/15/08	1.00	100.0	100.00
W802119-01	RAWTP-01 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W820106-MS1	RAWTP-01 0-2"MS	MS	SOIL	5/15/08	1.00	100.0	100.00
W820106-MSD1	RAWTP-01 0-2"MSD	MSD	SOIL	5/15/08	1.00	100.0	100.00
W802119-02	RAWTP-02 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802119-03	RAWTP-03 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802119-04	RAWTP-04 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802119-05	RAWTP-05 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802119-06	RAWTP-06 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802119-07	RAWTP-07 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802119-08	RAWTP-08 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802119-09	RAWTP-09 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802119-10	RAWTP-10 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802119-11	RAWTP-11 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802119-12	RAWTP-12 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802119-13	RAWTP-13 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802119-14	RAWTP-15 0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802119-15	RAWTP-BFD-0-2"	SAM	SOIL	5/15/08	1.00	100.0	100.00

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802119

Instrument ID Number: OPTIMA7 Method: P Run Number: W820106

Start Date: 5/18/2008 End Date: 5/18/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN			
CALIB BLANK 1	1.00	1511				X							X		X															
STD1	1.00	1517				X							X		X															
STD2	1.00	1522																												
STD3	1.00	1527																												
STD4	1.00	1531																												
STD5	1.00	1535																												
ICV	1.00	1540				X							X		X															
ICB	1.00	1545				X							X		X															
CRI	1.00	1550				X							X		X															
ICSA	1.00	1556				X							X		X															
ICSAB	1.00	1602				X							X		X															
CCV	1.00	1607				X							X		X															
CCB	1.00	1613				X							X		X															
PBS	1.00	1619				X							X		X															
LCSS	1.00	1625				X							X		X															
RAWTP-01 0-2"	10.00	1630				X							X		X															
RAWTP-01 0-2"MS	10.00	1636				X							X		X															
RAWTP-01 0-2"MSD	10.00	1641				X							X		X															
RAWTP-02 0-2"	10.00	1646				X							X		X															
RAWTP-03 0-2"	10.00	1651				X							X		X															
RAWTP-04 0-2"	10.00	1657				X									X															
RAWTP-05 0-2"	10.00	1703				X							X		X															
RAWTP-06 0-2"	10.00	1708				X							X		X															
CCV	1.00	1714				X							X		X															
CCB	1.00	1719				X							X		X															
CCB	1.00	1730				X							X		X															
RAWTP-07 0-2"	10.00	1736				X							X		X															
RAWTP-07 0-2"	10.00	1741				X							X		X															
RAWTP-09 0-2"	10.00	1746				X							X		X															
RAWTP-10 0-2"	10.00	1752				X							X		X															
RAWTP-11 0-2"	10.00	1757				X							X		X															
RAWTP-12 0-2"	10.00	1803				X							X		X															
RAWTP-13 0-2"	10.00	1809				X							X		X															
RAWTP-15 0-2"	10.00	1814				X							X		X															
RAWTP-BFD-0-2"	10.00	1819				X							X		X															
CCV	1.00	1825				X							X		X															

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802119

Instrument ID Number: OPTIMA7 Method: P Run Number: W820106

Start Date: 5/18/2008 End Date: 5/18/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CCB	1.00	1830				X							X		X											

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802119

Instrument ID Number: OPTIMA7 Method: P Run Number: W820106A

Start Date: 5/27/2008 End Date: 5/27/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CALIB BLANK 1	1.00	0720											X														
STD1	1.00	0725											X														
STD2	1.00	0731																									
STD3	1.00	0735																									
STD4	1.00	0740																									
STD5	1.00	0744																									
ICV	1.00	0748											X														
ICB	1.00	0754											X														
CRI	1.00	0759											X														
ICSA	1.00	0805											X														
ICSAB	1.00	0811											X														
ICSAB	1.00	0819											X														
CCV	1.00	0825											X														
CCB	1.00	0831											X														
RAWTP-04 0-2"	20.00	0841											X														
CCV	1.00	0847											X														
CCB	1.00	0853											X														

Innovative Technical Solutions, Inc.
A Gilbane Company

October 12, 2011

Dr. Casey McKeon
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

RE: ITSI DATA VALIDATION REPORT
RESOLUTION COPPER MINING
HUMAN HEALTH RISK ASSESSMENT
SDG W802119

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) has completed the data review for Resolution Copper Mining (RCM) for its Human Health Risk Assessment (HHRA) soil samples collected in 2008. ITSI performed data review as described in the U.S. Environmental Protection Agency's (EPA) *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004; and the *Sampling and Analysis Plan (SAP) for Clean Closure at Resolution Copper Mining Limited (Resolution), West Plant Site, Superior Mine* , (Golder, June 2005).

The acronym and abbreviations list is included as Appendix A. Client communications are provided as Appendix B. The ITSI standard legal notice is provided as Appendix C.

1.0 CROSS REFERENCE OF SAMPLES VERIFIED

The analytical data presented in the laboratory Sample Delivery Group (SDG) listed in Table 1 underwent an EPA Level III data validation. The Level III data validation is equivalent to a Step 2A validation, manual (S2AVM) as defined in the *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009). The SDGs contained data for arsenic, copper and lead by EPA Method 6010B. The primary analytical laboratory was SVL of Kellogg, Idaho. Table 1 below provides an analytical summary and cross reference for the samples.

1501 West Fountainhead Parkway, Suite 350
Tempe, Arizona 85282

(480) 706-6488
fax (480) 704-2952
www.itsi.com

Table 1 Analytical Summary and Cross Reference for Method 6010B

Client Sample ID	Laboratory SDG Number	Date Sampled	Type
RAWTP-01 0-2"	W802119-01	5/01/2008	MS/MSD
RAWTP-02 0-2"	W802119-02	4/30/2008	
RAWTP-03 0-2"	W802119-03	4/30/2008	
RAWTP-04 0-2"	W802119-04	5/01/2008	
RAWTP-05 0-2"	W802119-05	5/01/2008	
RAWTP-06 0-2"	W802119-06	5/01/2008	
RAWTP-07 0-2"	W802119-07	5/01/2008	
RAWTP-08 0-2"*	W802119-08	4/30/2008	
RAWTP-09 0-2"	W802119-09	4/30/2008	
RAWTP-10 0-2"	W802119-10	4/30/2008	
RAWTP-11 0-2"	W802119-11	5/01/2008	
RAWTP-12 0-2"	W802119-12	4/28/2008	
RAWTP-13 0-2"	W802119-13	5/01/2008	
RAWTP-15 0-2"	W802119-14	4/30/2008	
RAWTP-BFD-0-2"**	W802119-15	4/30/2008	

*Sample listed as RAWTP-07 0-2" on initial COC and laboratory report; manually corrected on report and COC to RAWTP-08 0-2" by Golder.
**Sample was not identified as a field duplicate by the client.
MS/MSD = Matrix spike/Matrix spike duplicate

The EPA S2AVM data validation included review of the report from the laboratory equivalent to an abbreviated EPA Level III data deliverable with standardized EPA forms. Level III data deliverables contain the sample results and chain-of-custody forms along with basic Quality Control (QC) summaries including surrogate recoveries, method blank results, and precision and accuracy data summaries for the sample preparation batch. As discussed in Section 2.0 below, the laboratory did not include any comments in the case narrative addressing any QC problems.

2.0 LABORATORY REPORT

The data were reported by the laboratory as an EPA Level III deliverable with standardized EPA forms. The data qualifiers noted by the laboratory in the report were reviewed. Anomalies that required data qualification, if any, are discussed in the sections below. Since the laboratory did not include a case narrative in the report, only the quality control anomalies from the Level III data deliverable could be addressed. Also, there was no official laboratory signature authorizing the release of the report or issue date. ITSI advises that all laboratory reports received by the client contain an official signature authorizing the release of the report and that the issue date should be documented on the

report. In addition, the laboratory should provide an officially signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

3.0 SAMPLE INTEGRITY

The Chains-of-Custody (COC) for the April 28 through May 01, 2008 sampling event were available for review. There were no anomalies that required qualification of the data, however, the following COC anomaly was observed.

- The transfer of the samples to the shipping carrier was not documented on the COC. The client indicated that the samplers shipped the samples to SVL via FedEx. ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number. A copy of the communication with the client verifying the transfer of samples to FedEx is provided in Appendix B.

4.0 HOLDING TIME

The samples were analyzed within the recommended method holding time of 180 days after collection.

5.0 INITIAL AND CONTINUING CALIBRATION

The initial and continuing calibrations were not reviewed for this level of validation.

6.0 BLANK EVALUATION

Preparation and equipment blanks were reviewed. The equipment blank(s) associated with the samples are listed in the Data Validation Report (DVR) for SDG W802216. There were no compounds detected in any of the blanks that required qualification of the data.

7.0 LABORATORY CONTROL SAMPLE

A laboratory control sample (LCS) was reported for each analysis. QC results were reviewed using the control limits listed in Table C6 of the SAP. There were no LCS anomalies that required qualification of the data.

8.0 MATRIX SPIKE AND MATRIX SPIKE DUPLICATE

The project matrix spike/matrix spike duplicate (MS/MSD) pair was reviewed using the laboratory control limits of 75 to 125 percent for accuracy and 20 relative percent difference (RPD) for precision. The sample used as the MS/MSD pair is identified in Table 1. There were no MS/MSD anomalies that required qualification of the data.

9.0 REPORTING LIMIT SPIKES

Spikes prepared at the laboratory's reporting limit were reviewed. There were no reporting limit spike anomalies that required qualification of the data.

10.0 COMPOUND QUANTITATION AND IDENTIFICATION

The laboratory reporting limits and quantitative results were reviewed. All reporting limits met the Client Required Detection Limits (CRDLs) listed in the SAP. There were no quantitative anomalies that required qualification of the data, however, the following observation was made.

- There were no units listed on reporting Form 10 for the instrument method detection limits (MDLs) and practical quantitation limits (PQLs) provided with the data package. To provide traceability of laboratory reporting limits from the instrument to the reported data, the laboratory is advised to list the MDL and PQL units on all reporting forms.

11.0 FIELD DUPLICATE SAMPLES

There were no field duplicate samples identified in this SDG.

12.0 RECOMMENDATIONS

ITSI recommends the following actions.

- ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number.

- ITSI advises that all laboratory reports contain an official signature authorizing the release of the report and that the issue date be documented on the report. Also, the laboratory should provide a properly signed report for the data in this

SDG indicating the original and revised issue dates that attest to the validity of the data.

- ITSI advises the laboratory to list the MDL and PQL units on all reporting forms to provide traceability of laboratory reporting limits from the instrument to the reported data.

13.0 OVERALL ASSESSMENT FOR RCM HHRA APRIL 28 THROUGH MAY 01, 2008 SAMPLING EVENT

There were no qualified results for this sampling event. Based on the available information, the data are considered useable for their intended purposes.

We thank you for the opportunity to serve you and look forward to supporting RCM with data review in the future.

Sincerely,

Innovative Technical Solutions, Inc.

Evelyn Dawson, CHMM
Program Chemist

Enclosures:

Appendix A – List of Acronyms and Abbreviations
Appendix B – Client Communication
Appendix C – ITSI Standard Legal Notice

cc: John Malusa
Golder Associates, Inc.
4730 North Oracle Road, Suite 210
Tucson, Arizona, 85705

APPENDIX A

LIST OF ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS AND ABBREVIATIONS

COC	chain-of-custody
CRDL	Client Required Detection Limits
EPA	U.S. Environmental Protection Agency
FD	field duplicate
HHRA	Human Health Risk Assessment
ITSI	Innovative Technical Solutions, Inc.
LCS	laboratory control spike
MS/MSD	matrix spike/matrix spike duplicate
PS	parent sample
QC	quality control
QRT	Qualified Results Table
RPD	relative percent difference
RCM	Resolution Copper Mining
SAP	Sample Analysis Plan
S2AVM	Step 2A validation, manual
SDG	Sample Delivery Group

APPENDIX B

CLIENT COMMUNICATION

Peggy Cota

From: Morfin, Orestes <Orestes_Morfin@golder.com>
Sent: Tuesday, September 27, 2011 1:52 PM
To: Peggy Cota; Evelyn Dawson
Cc: Malusa, John
Subject: 2008 RAWTP sample shipping

Hello Peggy and Evelyn,
I received an e-mail today from Alejandra Bonilla, one of the two field crew who collected the 2008 RAWTP samples. She confirmed that the samples were shipped to SVL via FedEx.
I hope that helps.
Sincerely,
Orestes

Orestes Morfín (M.Sc.)| Project Hydrogeochemist | **Golder Associates Ltd.**
102, 2535 - 3rd Avenue S.E., Calgary, Alberta, Canada T2A 7W5
T: +1 (403) 299 5600 | **D:** +1 403 513-3574 | **F:** +1 (403) 299-5606 | **C:** +1 | **E:** Orestes_Morfin@golder.com | **www.golder.com**

Work Safe, Home Safe

APPENDIX C

ITSI STANDARD LEGAL NOTICE

ITSI STANDARD LEGAL NOTICE

ITSI is issuing this report at the request of the Client and based upon information furnished by Client. Further, the presence of environmental contamination can be influenced by many factors, including unknown and changing underground conditions. Therefore: 1. This report may not be relied upon by anyone for financial decision-making. 2. No one other than Client is authorized to use this report for any purpose. 3. Any conclusions or opinions included in this report are subject to reasonable revision based upon any new environmental or other data which is later developed. 4. Any results or conclusions stated are to be considered limited by the quality of the underlying sample or other data on which they are based, the budget established by the Client or otherwise for gathering and analyzing data, and by any assumptions and qualifications contained within this report.

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802122 **Method Type:** **SOW No.:** SW-846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802122-01	RAWTP-16 0-2"	
W802122-02	RAWTP-17 0-2"	
W802122-03	RAWTP-18 0-2"	
W802122-04	RAWTP-19 0-2"	
W802122-05	RAWTP-20 0-2"	
W802122-06	RAWTP-BFD-06	
W802122-07	RAWTP-21 0-2"	
W802122-08	RAWTP-22 0-2"	
W802122-09	RAWTP-23 0-2"	
W802122-10	RAWTP-24 0-2"	
W802122-11	RAWTP-25 0-2"	
W802122-12	RAWTP-26 0-2"	
W802122-13	RAWTP-27 0-2"	
W802122-14	RAWTP-28 0-2"	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802122 **Method Type:** **SOW No.:** SW-846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802122-15	RAWTP-29 0-2"	
W802122-16	RAWTP-30 0-2"	
W802122-17	RAWTP-BFD-07	
W819185-MS1	RAWTP-16 0-2"MS1	Matrix Spike
W819185-MSD1	RAWTP-16 0-2"MSD1	Matrix Spike Duplicate

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-01 **Client ID:** RAWTP-16 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	331	mg/Kg		D	P	7.1	OPTIMA7	W819185
7440-50-8	Copper	6870	mg/Kg		D	P	2.9	OPTIMA7	W819185
7439-92-1	Lead	170	mg/Kg		D	P	2.3	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-02 **Client ID:** RAWTP-17 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	2590	mg/Kg		D	P	35.5	OPTIMA7	W819185
7440-50-8	Copper	100000	mg/Kg		D	P	14.5	OPTIMA7	W819185
7439-92-1	Lead	1050	mg/Kg		D	P	11.5	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-03 **Client ID:** RAWTP-18 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	1390	mg/Kg		D	P	7.1	OPTIMA7	W819185
7440-50-8	Copper	31900	mg/Kg		D	P	2.9	OPTIMA7	W819185
7439-92-1	Lead	582	mg/Kg		D	P	2.3	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: GREEN **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-04 **Client ID:** RAWTP-19 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	28.6	mg/Kg			P	0.71	OPTIMA7	W819185
7440-50-8	Copper	763	mg/Kg			P	0.29	OPTIMA7	W819185
7439-92-1	Lead	32.6	mg/Kg			P	0.23	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-05 **Client ID:** RAWTP-20 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	730	mg/Kg		D	P	7.1	OPTIMA7	W819185
7440-50-8	Copper	4500	mg/Kg		D	P	2.9	OPTIMA7	W819185
7439-92-1	Lead	375	mg/Kg		D	P	2.3	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-07 **Client ID:** RAWTP-21 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	200	mg/Kg		D	P	7.1	OPTIMA7	W819185
7440-50-8	Copper	2560	mg/Kg		D	P	2.9	OPTIMA7	W819185
7439-92-1	Lead	153	mg/Kg		D	P	2.3	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-08 **Client ID:** RAWTP-22 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	1480	mg/Kg		D	P	7.1	OPTIMA7	W819185
7440-50-8	Copper	37400	mg/Kg		D	P	2.9	OPTIMA7	W819185
7439-92-1	Lead	715	mg/Kg		D	P	2.3	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-09 **Client ID:** RAWTP-23 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	194	mg/Kg			P	0.71	OPTIMA7	W819185
7440-50-8	Copper	889	mg/Kg			P	0.29	OPTIMA7	W819185
7439-92-1	Lead	118	mg/Kg			P	0.23	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-10 **Client ID:** RAWTP-24 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	326	mg/Kg		D	P	7.1	OPTIMA7	W819185
7440-50-8	Copper	3150	mg/Kg		D	P	2.9	OPTIMA7	W819185
7439-92-1	Lead	203	mg/Kg		D	P	2.3	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-11 **Client ID:** RAWTP-25 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	204	mg/Kg			P	0.71	OPTIMA7	W819185
7440-50-8	Copper	2100	mg/Kg			P	0.29	OPTIMA7	W819185
7439-92-1	Lead	169	mg/Kg			P	0.23	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-12 **Client ID:** RAWTP-26 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	102	mg/Kg			P	0.71	OPTIMA7	W819185
7440-50-8	Copper	1180	mg/Kg			P	0.29	OPTIMA7	W819185
7439-92-1	Lead	104	mg/Kg			P	0.23	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-13 **Client ID:** RAWTP-27 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	461	mg/Kg		D	P	7.1	OPTIMA7	W819185
7440-50-8	Copper	12000	mg/Kg		D	P	2.9	OPTIMA7	W819185
7439-92-1	Lead	330	mg/Kg		D	P	2.3	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-14 **Client ID:** RAWTP-28 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	252	mg/Kg			P	0.71	OPTIMA7	W819185
7440-50-8	Copper	841	mg/Kg			P	0.29	OPTIMA7	W819185
7439-92-1	Lead	126	mg/Kg			P	0.23	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-15 **Client ID:** RAWTP-29 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	230	mg/Kg			P	0.71	OPTIMA7	W819185
7440-50-8	Copper	2110	mg/Kg			P	0.29	OPTIMA7	W819185
7439-92-1	Lead	184	mg/Kg			P	0.23	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-16 **Client ID:** RAWTP-30 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	57.9	mg/Kg			P	0.71	OPTIMA7	W819185
7440-50-8	Copper	845	mg/Kg			P	0.29	OPTIMA7	W819185
7439-92-1	Lead	66.1	mg/Kg			P	0.23	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-06 **Client ID:** RAWTP-BFD-06

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	656	mg/Kg		D	P	7.1	OPTIMA7	W819185
7440-50-8	Copper	4430	mg/Kg		D	P	2.9	OPTIMA7	W819185
7439-92-1	Lead	354	mg/Kg		D	P	2.3	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-17 **Client ID:** RAWTP-BFD-07

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	66.2	mg/Kg			P	0.71	OPTIMA7	W819185
7440-50-8	Copper	931	mg/Kg			P	0.29	OPTIMA7	W819185
7439-92-1	Lead	70.5	mg/Kg			P	0.23	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802122
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV					**Source:** 08E0067				
	Arsenic	2066.52	2000.0	103	90.0 - 110.0	P	5/15/2008	10:29	W819185
	Copper	2019.35	2000.0	101	90.0 - 110.0	P	5/15/2008	10:29	W819185
	Lead	2049.95	2000.0	102	90.0 - 110.0	P	5/15/2008	10:29	W819185
ICV					**Source:** 08E0067				
	Arsenic	2042.25	2000.0	102	90.0 - 110.0	P	5/15/2008	10:36	W819185
	Copper	2000.87	2000.0	100	90.0 - 110.0	P	5/15/2008	10:36	W819185
	Lead	2042.71	2000.0	102	90.0 - 110.0	P	5/15/2008	10:36	W819185
CCV					**Source:** 08E0067				
	Arsenic	2015.10	2000.0	101	90.0 - 110.0	P	5/15/2008	11:03	W819185
	Copper	2008.46	2000.0	100	90.0 - 110.0	P	5/15/2008	11:03	W819185
	Lead	2041.59	2000.0	102	90.0 - 110.0	P	5/15/2008	11:03	W819185
CCV					**Source:** 08E0067				
	Arsenic	2028.94	2000.0	101	90.0 - 110.0	P	5/15/2008	12:21	W819185
	Copper	1979.76	2000.0	99	90.0 - 110.0	P	5/15/2008	12:21	W819185
	Lead	1988.60	2000.0	99	90.0 - 110.0	P	5/15/2008	12:21	W819185
CCV					**Source:** 08E0067				
	Arsenic	2020.38	2000.0	101	90.0 - 110.0	P	5/15/2008	13:24	W819185
	Copper	2004.47	2000.0	100	90.0 - 110.0	P	5/15/2008	13:24	W819185
	Lead	2041.02	2000.0	102	90.0 - 110.0	P	5/15/2008	13:24	W819185
CCV					**Source:** 08E0067				
	Arsenic	2022.51	2000.0	101	90.0 - 110.0	P	5/15/2008	13:39	W819185
	Copper	2005.77	2000.0	100	90.0 - 110.0	P	5/15/2008	13:39	W819185
	Lead	2026.79	2000.0	101	90.0 - 110.0	P	5/15/2008	13:39	W819185

- 2b -
CRDL STANDARD FOR AA & ICP

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Advisory Limits (%R)	M	Analysis Date	Analysis Time	Run Number
CRI					**Source:** 08E0089				
	Arsenic	26.66	25.0	107	50 - 150	P	5/15/2008	10:46	W819185
	Copper	10.54	10.0	105	50 - 150	P	5/15/2008	10:46	W819185
	Lead	8.16	7.5	109	50 - 150	P	5/15/2008	10:46	W819185

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/15/2008	10:41	W819185
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/15/2008	10:41	W819185
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/15/2008	10:41	W819185
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/15/2008	11:08	W819185
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/15/2008	11:08	W819185
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/15/2008	11:08	W819185
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/15/2008	12:26	W819185
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/15/2008	12:26	W819185
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/15/2008	12:26	W819185
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/15/2008	13:28	W819185
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/15/2008	13:28	W819185
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/15/2008	13:28	W819185
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/15/2008	13:44	W819185
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/15/2008	13:44	W819185
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/15/2008	13:44	W819185

- 3b -
PREPARATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result (mg/Kg)	Conc Qual	Q	Acceptance Limit	MDL	PQL	M	Analysis Date	Analysis Time	Run
PBS			**SOIL**								
	Arsenic	0.710U			+/-0.710	0.710	2.500	P	5/15/2008	11:29	W819185
	Copper	0.436J			+/-0.290	0.290	1.000	P	5/15/2008	11:29	W819185
	Lead	0.230U			+/-0.230	0.230	0.750	P	5/15/2008	11:29	W819185

- 4 -

INTERFERENCE CHECK SAMPLE

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window	Analysis Date	Analysis Time	Run Number
ICSA					**Source:** 08E0109/08E0110			
	Arsenic	9.4				5/15/2008	10:52	W819185
	Copper	10700	10000	107	80 - 120%	5/15/2008	10:52	W819185
	Lead	2.3				5/15/2008	10:52	W819185
ICSAB					**Source:** 08E0109/08E0110			
	Arsenic	513	500	103	80 - 120%	5/15/2008	10:58	W819185
	Copper	516	500	103	80 - 120%	5/15/2008	10:58	W819185
	Lead	460	500	92	80 - 120%	5/15/2008	10:58	W819185

- 5a -

MATRIX SPIKE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802122-01 **Client ID:** RAWTP-16 0-2"MS1

Percent Solids for Sample: 100.00 **Spiked ID:** W819185-MS1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	439.7340		330.6091		100.00	109		P
Copper	mg/Kg	75 - 125	7113.0320		6871.5090		100.00	242		P
Lead	mg/Kg	75 - 125	274.9079		170.0552		100.00	105		P

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802122-01 **Client ID:** RAWTP-16 0-2"MSD1

Percent Solids for Sample: 100.00 **Spiked ID:** W819185-MSD1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	464.1165		330.6091		100.00	134		P
Copper	mg/Kg	75 - 125	7212.9860		6871.5090		100.00	341		P
Lead	mg/Kg	75 - 125	281.1510		170.0552		100.00	111		P

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W819185-MS1 **Client ID:** RAWTP-16 0-2"MSD1

Percent Solids for Sample: 100.00 **Duplicate ID:** W819185-MSD1 **Percent Solids for Duplicate:** 100.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	mg/Kg		439.7340		464.1165		5		P
Copper	mg/Kg		7113.0320		7212.9860		1		P
Lead	mg/Kg		274.9079		281.1510		2		P

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSS			**LCS Source:**	**QC19115SCSN**			**Batch Number:**	**3050B-05132**
	Arsenic	mg/Kg	100.0	95.5		96	80.0 - 120.0	P
	Copper	mg/Kg	100.0	99.2		99	80.0 - 120.0	P
	Lead	mg/Kg	100.0	96.5		96	80.0 - 120.0	P

- 10 -
METHOD DETECTION LIMITS

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Analyte	Wave- length (nm)	MDL	PQL
OPTIMA7			**Date:** 3/20/2008
OPT7 GOLDER			
Arsenic Soil	188.979	7.1	25
Copper Soil	324.752	2.9	10
Lead Soil	220.353	2.3	7.5
Arsenic Water	188.979	8.8	25
Copper Water	324.752	5.8	10
Lead Water	220.353	2.7	7.5

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	Ag
Aluminum	308.22	0.0000000	0.0207190	0.0120300	-0.0515205	-4.9158802
Antimony	206.84	-0.0267947	-0.0235140	-0.0652917	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0026736	0.0617380	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0064810	-0.0021755	0.1105640	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0086530	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0128574	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0136640	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0719449	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.3618530	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0463195	0.0339874	0.0000000
Nickel	232.00	-0.0108972	-0.0086700	-0.2357930	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0671620	0.0000000	-0.0735814	0.0000000	0.0000000
Silver	328.07	0.0080000	0.0026432	-0.0431800	-0.0009512	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0159040	-0.0255790	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0196000	0.0000000	0.0000000
Zinc	206.20	0.0147479	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: As	B	Be	Cd	Co
Aluminum	308.22	-0.7712260	0.0000000	1.9230000	0.0000000	-8.4645996
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	-0.0452534
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0061070	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	-0.3502000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	2.2788999
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.6054300
Nickel	232.00	0.0000000	0.0000000	-0.4082000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	-0.0666463	0.0000000	0.0000000	-0.0206171
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	4.5946798
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.2605720	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Cr	Cu	Li	Mn	Mo
Aluminum	308.22	0.0000000	0.5861200	0.2252000	0.5555770	20.0904007
Antimony	206.84	5.5828600	0.0000000	0.0000000	0.0000000	-3.6831999
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	-0.1127460	0.0000000	0.0000000	0.0218515	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0613697
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	1.5008000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	-1.6574301
Cobalt	228.62	-0.1267530	0.0000000	0.0000000	0.0706386	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.5458750
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	-2.2182000	0.3641500	0.0000000	0.0915702	-0.2396000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	-1.5451100	0.0000000
Manganese	260.57	-0.1219760	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	13.8179998	-0.3078670	0.0000000	0.2056650	3.0824201
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	1.2911400	0.0000000
Silver	328.07	0.0000000	0.0327636	-0.0306730	0.1590960	0.0713769
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.3364670	0.0000000	0.0000000	-1.7416400	-0.5289330
Vanadium	292.40	-4.4160600	-0.0520540	0.0000000	-0.1773900	-0.4541660
Zinc	206.20	-1.5611300	0.0000000	0.0000000	0.3653180	0.8787460

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Na	Ni	Pb	Sb	Se
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0476335	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0648597	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.1080310	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.1204100	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	-0.2269880	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0048533	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.6535250	0.3507140

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Si	Sn	Sr	Ti	Tl
Aluminum	308.22	0.0000000	0.0000000	-3.8224199	2.0929599	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.5032240	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.1360430	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.1393840	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	2.0177901	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	-0.7596230	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	-0.0080177	-0.0100551	-0.0782215	0.0000000	-0.0094611
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	-1.9865000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.7094510	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.2964610

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: U	V	Zn	La	
Aluminum	308.22	-8.4760399	-10.4483004	-0.3308580	0.1640000	
Antimony	206.84	-1.1049000	0.0000000	0.0000000	0.0000000	
Arsenic	188.98	0.0000000	0.0000000	0.0000000	55.5082016	
Barium	233.53	-0.0388368	0.1318340	0.0000000	0.0000000	
Beryllium	313.11	-0.0741906	0.0000000	0.0000000	0.0000000	
Cadmium	226.50	-0.0501594	0.0000000	0.0000000	-0.1327000	
Calcium	315.89	2.6055901	-3.5826399	0.0000000	0.0000000	
Chromium	267.72	-1.0719800	0.1526560	0.0000000	0.0000000	
Cobalt	228.62	0.1274260	0.0000000	0.0000000	0.0000000	
Copper	324.75	0.5231330	-0.2011560	0.0000000	0.0000000	
Iron	273.96	-1.1845200	4.1059599	0.0000000	0.0000000	
Lead	220.35	1.2635400	0.0000000	0.0000000	0.4454000	
Magnesium	279.08	-12.8909998	0.0000000	0.0000000	0.0000000	
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	
Nickel	232.00	0.0000000	0.0000000	0.1456010	-20.4916000	
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	
Selenium	196.03	0.0000000	0.0000000	0.0000000	-4.0792599	
Silver	328.07	0.7184970	-0.1259390	0.0000000	-0.0451447	
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	
Thallium	190.80	0.0000000	2.5700600	0.0000000	0.0000000	
Vanadium	292.40	-1.5207601	0.0000000	0.0000000	0.9598270	
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 3/19/2008

Analyte	Integration Time (sec)	LDR ug/L	
Arsenic	20.00	50000	OPT7 GOLDER
Copper	20.00	90000	OPT7 GOLDER
Lead	20.00	100000	OPT7 GOLDER

- 13 -
SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802122

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number: 3050B-05132008	**Method:** P						
PBS	PBS	MB	SOIL	5/13/08	1.00	100.0	100.00
LCSS	LCSS	LCS	SOIL	5/13/08	1.00	100.0	100.00
W802122-01	RAWTP-16 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W819185-MS1	RAWTP-16 0-2"MS1	MS	SOIL	5/13/08	1.00	100.0	100.00
W819185-MSD1	RAWTP-16 0-2"MSD1	MSD	SOIL	5/13/08	1.00	100.0	100.00
W802122-02	RAWTP-17 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-03	RAWTP-18 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-04	RAWTP-19 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-05	RAWTP-20 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-06	RAWTP-BFD-06	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-07	RAWTP-21 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-08	RAWTP-22 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-09	RAWTP-23 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-10	RAWTP-24 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-11	RAWTP-25 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-12	RAWTP-26 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-13	RAWTP-27 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-14	RAWTP-28 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-15	RAWTP-29 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-16	RAWTP-30 0-2"	SAM	SOIL	5/13/08	1.00	100.0	100.00
W802122-17	RAWTP-BFD-07	SAM	SOIL	5/13/08	1.00	100.0	100.00

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802122

Instrument ID Number: OPTIMA7 Method: P Run Number: W819185

Start Date: 5/15/2008 End Date: 5/15/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN			
CALIB BLANK 1	1.00	1002				X							X		X															
STD1	1.00	1008				X							X		X															
STD2	1.00	1013																												
STD3	1.00	1017																												
STD4	1.00	1021																												
STD5	1.00	1025																												
ICV	1.00	1029				X							X		X															
ICV	1.00	1036				X							X		X															
ICB	1.00	1041				X							X		X															
CRI	1.00	1046				X							X		X															
ICSA	1.00	1052				X							X		X															
ICSAB	1.00	1058				X							X		X															
CCV	1.00	1103				X							X		X															
CCB	1.00	1108				X							X		X															
PBS	1.00	1129				X							X		X															
LCSS	1.00	1135				X							X		X															
RAWTP-16 0-2"	10.00	1140				X							X		X															
RAWTP-16 0-2"MS1	10.00	1145				X							X		X															
RAWTP-16 0-2"MSD1	10.00	1150				X							X		X															
RAWTP-17 0-2"	50.00	1155				X							X		X															
RAWTP-18 0-2"	10.00	1200				X							X		X															
RAWTP-19 0-2"	1.00	1205				X							X		X															
RAWTP-20 0-2"	10.00	1211				X							X		X															
RAWTP-BFD-06	10.00	1216				X							X		X															
CCV	1.00	1221				X							X		X															
CCB	1.00	1226				X							X		X															
RAWTP-21 0-2"	10.00	1232				X							X		X															
RAWTP-22 0-2"	10.00	1237				X							X		X															
RAWTP-23 0-2"	1.00	1242				X							X		X															
RAWTP-24 0-2"	10.00	1248				X							X		X															
RAWTP-25 0-2"	1.00	1253				X							X		X															
RAWTP-26 0-2"	1.00	1258				X							X		X															
RAWTP-27 0-2"	10.00	1302				X							X		X															
RAWTP-28 0-2"	1.00	1308				X							X		X															
RAWTP-29 0-2"	1.00	1313				X							X		X															
RAWTP-30 0-2"	1.00	1318				X							X		X															

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802122

Instrument ID Number: OPTIMA7 Method: P Run Number: W819185

Start Date: 5/15/2008 End Date: 5/15/2008

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CCV	1.00	1324				X							X		X												
CCB	1.00	1328				X							X		X												
RAWTP-BFD-07	1.00	1334				X							X		X												
CCV	1.00	1339				X							X		X												
CCB	1.00	1344				X							X		X												

Innovative Technical Solutions, Inc.
A Gilbane Company

October 07, 2011

Dr. Casey McKeon
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

RE: ITSI DATA VALIDATION REPORT
RESOLUTION COPPER MINING
HUMAN HEALTH RISK ASSESSMENT
SDG W802122

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) has completed the data review for Resolution Copper Mining (RCM) for its Human Health Risk Assessment (HHRA) soil samples collected in 2008. ITSI performed data review as described in the U.S. Environmental Protection Agency's (EPA) *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004; and the *Sampling and Analysis Plan (SAP) for Clean Closure at Resolution Copper Mining Limited (Resolution), West Plant Site, Superior Mine* , (Golder, June 2005).

The acronym and abbreviations list is included as Appendix A. Data review qualifiers have been marked in red directly on the analytical reports provided by the laboratory and are attached as Appendix B. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C. A summary of the field duplicate pair results is provided in the Field Duplicate Table as Appendix D. Client communications are provided as Appendix E. The ITSI standard legal notice is provided as Appendix F.

1.0 CROSS REFERENCE OF SAMPLES VERIFIED

The analytical data presented in the laboratory Sample Delivery Group (SDG) listed in Table 1 underwent an EPA Level III data validation. The Level III data validation is equivalent to a Step 2A validation, manual (S2AVM) as defined in the *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009). The SDGs contained data for arsenic, copper and lead by EPA Method 6010B.

1501 West Fountainhead Parkway, Suite 350
Tempe, Arizona 85282

(480) 706-6488
fax (480) 704-2952
www.itsi.com

The primary analytical laboratory was SVL of Kellogg, Idaho. Table 1 below provides an analytical summary and cross reference for the samples.

Table 1 Analytical Summary and Cross Reference for Method 6010B

Client Sample ID	Laboratory SDG Number	Date Sampled	Type
RAWTP-16 0-2"	W802122-01	4/28/2008	MS/MSD
RAWTP-17 0-2"	W802122-02	4/30/2008	
RAWTP-18 0-2"	W802122-03	4/29/2008	
RAWTP-19 0-2"	W802122-04	4/28/2008	
RAWTP-20 0-2"	W802122-05	5/01/2008	PS 1
RAWTP-BFD-06	W802122-06	5/01/2008	FD 1
RAWTP-21 0-2"	W802122-07	5/01/2008	
RAWTP-22 0-2"	W802122-08	4/29/2008	
RAWTP-23 0-2"	W802122-09	4/28/2008	
RAWTP-24 0-2"	W802122-10	4/29/2008	
RAWTP-25 0-2"	W802122-11	4/29/2008	
RAWTP-26 0-2"	W802122-12	4/29/2008	
RAWTP-27 0-2"	W802122-13	4/28/2008	
RAWTP-28 0-2"	W802122-14	4/28/2008	
RAWTP-29 0-2"	W802122-15	4/28/2008	
RAWTP-30 0-2"	W802122-16	4/28/2008	PS 2
RAWTP-BFD-07	W802122-17	4/28/2008	FD 2

FD = Field duplicate sample
MS/MSD = Matrix spike/Matrix spike duplicate
PS = Parent sample of field duplicate

The EPA S2AVM data validation included review of the report from the laboratory equivalent to an abbreviated EPA Level III data deliverable with standardized EPA forms. Level III data deliverables contain the sample results and chain-of-custody forms along with basic Quality Control (QC) summaries including surrogate recoveries, method blank results, and precision and accuracy data summaries for the sample preparation batch. As discussed in Section 2.0 below, the laboratory did not include any comments in the case narrative addressing any QC problems.

2.0 LABORATORY REPORT

The data were reported by the laboratory as an EPA Level III deliverable with standardized EPA forms. The data qualifiers noted by the laboratory in the report were reviewed. Anomalies that required data qualification, if any, are discussed in the sections below. Since the laboratory did not include a case narrative in the report, only the quality control anomalies from the Level III data deliverable could be addressed. Also, there was no official laboratory signature authorizing the release of the report or issue date. ITSI

advises that all laboratory reports received by the client contain an official signature authorizing the release of the report and that the issue date should be documented on the report. In addition, the laboratory should provide an officially signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

3.0 SAMPLE INTEGRITY

The Chains-of-Custody (COC) for the April 28 through May 01, 2008 sampling event were available for review. There were no anomalies that required qualification of the data, however, the following COC anomaly was observed.

- The transfer of the samples to the shipping carrier was not documented on the COC. The client indicated that the samplers shipped the samples to SVL via FedEx. ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number. A copy of the communication with the client verifying the transfer of samples to FedEx is provided in Appendix E.

4.0 HOLDING TIME

The samples were analyzed within the recommended method holding time of 180 days after collection.

5.0 INITIAL AND CONTINUING CALIBRATION

The initial and continuing calibrations were not reviewed for this level of validation.

6.0 BLANK EVALUATION

Preparation and equipment blanks were reviewed. The equipment blank(s) associated with the samples are listed in the Data Validation Report (DVR) for SDG W802216. There were no compounds detected in any of the blanks that required qualification of the data.

7.0 LABORATORY CONTROL SAMPLE

A laboratory control sample (LCS) was reported for each analysis. QC results were reviewed using the control limits listed in Table C6 of the SAP. There were no LCS anomalies that required qualification of the data.

8.0 MATRIX SPIKE AND MATRIX SPIKE DUPLICATE

The project matrix spike/matrix spike duplicate (MS/MSD) pair was reviewed using the laboratory control limits of 75 to 125 percent for accuracy and 20 relative percent difference (RPD) for precision. The sample used as the MS/MSD pair is identified in Table 1. There were no MS/MSD anomalies that required qualification of the data except at noted below.

- The MSD percent recovery for arsenic was out of the upper control limit of 125 percent at 134 percent. Since the associated LCS recovery was acceptable, only the result in the sample spiked, RAWTP-16 0-2", has been qualified as "J+" for an estimated value with a high bias.

9.0 REPORTING LIMIT SPIKES

Spikes prepared at the laboratory's reporting limit were reviewed. There were no reporting limit spike anomalies that required qualification of the data.

10.0 COMPOUND QUANTITATION AND IDENTIFICATION

The laboratory reporting limits and quantitative results were reviewed. All reporting limits met the Client Required Detection Limits (CRDLs) listed in the SAP. There were no quantitative anomalies that required qualification of the data. However, the following observation was made.

- There were no units listed on reporting Form 10 for the instrument method detection limits (MDLs) and practical quantitation limits (PQLs) provided with the data package. To provide traceability of laboratory reporting limits from the instrument to the reported data, the laboratory is advised to list the MDL and PQL units on all reporting forms.

11.0 FIELD DUPLICATE SAMPLES

Field duplicate sets were collected and analyzed to measure field and laboratory precision. The results of the field duplicate and parent samples were compared and are summarized in the Field Duplicate Table presented as Appendix D. All field duplicate results were acceptable.

12.0 RECOMMENDATIONS

ITSI recommends the following actions.

- ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number.

- ITSI advises that all laboratory reports must contain an official signature authorizing the release of the report and that the issue date be documented on the report. Also, the laboratory should provide a properly signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

- ITSI advises the laboratory to list the MDL and PQL units on all reporting forms to provide traceability of laboratory reporting limits from the instrument to the reported data.

13.0 OVERALL ASSESSMENT FOR RCM HHRA APRIL 28 THROUGH MAY 01, 2008 SAMPLING EVENT

There were no rejected results for this sampling event. Based on the available information, the data as qualified are considered useable for their intended purposes. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C.

We thank you for the opportunity to serve you and look forward to supporting RCM with data review in the future.

Sincerely,

Innovative Technical Solutions, Inc.

Evelyn Dawson, CHMM

Program Chemist

Enclosures:

Appendix A – List of Acronyms and Abbreviations
Appendix B – Qualified Report Pages
Appendix C – Qualified Results Table
Appendix D – Field Duplicate Table
Appendix E – Client Communication
Appendix F – ITSI Standard Legal Notice

cc: John Malusa
Golder Associates, Inc.
4730 North Oracle Road, Suite 210
Tucson, Arizona, 85705

APPENDIX A

LIST OF ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS AND ABBREVIATIONS

COC	chain-of-custody
CRDL	Client Required Detection Limits
EPA	U.S. Environmental Protection Agency
FD	field duplicate
HHRA	Human Health Risk Assessment
ITSI	Innovative Technical Solutions, Inc.
LCS	laboratory control spike
MDL	method detection limits
MS/MSD	matrix spike/matrix spike duplicate
PQL	practical quantitation limits
PS	parent sample
QC	quality control
QRT	Qualified Results Table
RPD	relative percent difference
RCM	Resolution Copper Mining
SAP	Sample Analysis Plan
S2AVM	Step 2A validation, manual
SDG	Sample Delivery Group

APPENDIX B

QUALIFIED REPORT PAGES

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802122 **Method Type:**

Sample ID: W802122-01 **Client ID:** RAWTP-16 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/6/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	331 J+	mg/Kg		D	P	7.1	OPTIMA7	W819185
7440-50-8	Copper	6870	mg/Kg		D	P	2.9	OPTIMA7	W819185
7439-92-1	Lead	170	mg/Kg		D	P	2.3	OPTIMA7	W819185

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

PGC ITSI
30Sep2011

APPENDIX C

QUALIFIED RESULTS TABLE

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Parameter	Original Value	Added Qualifier	New Value	PQL	MDL	Units	Reason	Validator
W802122-01	RAWTP-16 0-2"	4/28/2008	Soil	EPA 6010B	Arsenic	331	J+	25 J+	25	7.1	mg/kg	%R MSD	PGC/EHD

Notes
J+ = estimated value with high bias
mg/kg = milligrams per kilogram

%R = percent recovery
MDL = method detection limit
MSD = matrix spike duplicate
PQL = Practical Quantitation Limit

APPENDIX D

FIELD DUPLICATE TABLE

Field Duplicate Results
Resolution Copper Mining
Human Health Risk Assessment

Client ID Primary/FD	Laboratory ID Primary/FD	Metal	Sample mg/kg	Duplicate mg/kg	RPD	Agreement (Yes) Non-agreement (No)
RAWTP-20 0-2" / RAWTP-BFD-06	W802122-05 / 06	Arsenic	730	656	11%	Yes
RAWTP-20 0-2" / RAWTP-BFD-06	W802122-05 / 06	Lead	4500	4430	2%	Yes
RAWTP-20 0-2" / RAWTP-BFD-06	W802122-05 / 06	Copper	375	354	6%	Yes
RAWTP-30 0-2" / RAWTP-BFD-07	W802122-16 / 17	Arsenic	57.9	66.2	13%	Yes
RAWTP-30 0-2" / RAWTP-BFD-07	W802122-16 / 17	Lead	845	931	10%	Yes
RAWTP-30 0-2" / RAWTP-BFD-07	W802122-16 / 17	Copper	66.1	70.5	6%	Yes

Notes

mg/kg = milligrams per kilogram
FD = field duplicate
YES = RPD less than control limit of 35
RPD = relative percent difference

APPENDIX E

CLIENT COMMUNICATION

Peggy Cota

From: Morfin, Orestes <Orestes_Morfin@golder.com>
Sent: Tuesday, September 27, 2011 1:52 PM
To: Peggy Cota; Evelyn Dawson
Cc: Malusa, John
Subject: 2008 RAWTP sample shipping

Hello Peggy and Evelyn,
I received an e-mail today from Alejandra Bonilla, one of the two field crew who collected the 2008 RAWTP samples. She confirmed that the samples were shipped to SVL via FedEx.
I hope that helps.
Sincerely,
Orestes

Orestes Morfín (M.Sc.)| Project Hydrogeochemist | **Golder Associates Ltd.**
102, 2535 - 3rd Avenue S.E., Calgary, Alberta, Canada T2A 7W5
T: +1 (403) 299 5600 | **D:** +1 403 513-3574 | **F:** +1 (403) 299-5606 | **C:** +1 | **E:** Orestes_Morfin@golder.com | **www.golder.com**

Work Safe, Home Safe

APPENDIX F

ITSI STANDARD LEGAL NOTICE

ITSI STANDARD LEGAL NOTICE

ITSI is issuing this report at the request of the Client and based upon information furnished by Client. Further, the presence of environmental contamination can be influenced by many factors, including unknown and changing underground conditions. Therefore: 1. This report may not be relied upon by anyone for financial decision-making. 2. No one other than Client is authorized to use this report for any purpose. 3. Any conclusions or opinions included in this report are subject to reasonable revision based upon any new environmental or other data which is later developed. 4. Any results or conclusions stated are to be considered limited by the quality of the underlying sample or other data on which they are based, the budget established by the Client or otherwise for gathering and analyzing data, and by any assumptions and qualifications contained within this report.

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802148 **Method Type:** **SOW No.:** SW-846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802148-01	RAWTP-01 2"-1'	
W802148-02	RAWTP-01 1'-2'	
W802148-03	RAWTP-03 2"-1'	
W802148-04	RAWTP-03 1'-2'	
W802148-05	RAWTP-03 2'-3'	
W802148-06	RAWTP-03 3'-4'	
W802148-07	RAWTP-17 2"-1'	
W802148-08	RAWTP-17 1'-2'	
W802148-09	RAWTP-17 2'-3'	
W802148-10	BFD-10	
W802148-11	RAWTP-04 2"-1'	
W802148-12	RAWTP-04 1'-2'	
W802148-13	RAWTP-04 2'-3'	
W802148-14	RAWTP-05 2"-1'	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802148 **Method Type:** **SOW No.:** SW-846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802148-15	RAWTP-05 1'-2'	
W802148-16	BFD-4	
W802148-17	RAWTP-06 2"-1'	
W802148-18	RAWTP-06 1'-2'	
W802148-19	RAWTP-06 2'-3'	
W802148-20	RAWTP-06 3'-4'	
W820223-MS1	RAWTP-01 2"-1'MS1	Matrix Spike
W820223-MSD1	RAWTP-01 2"-1'MSD1	Matrix Spike Duplicate

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-10 **Client ID:** BFD-10

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	171	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	2690	mg/Kg		D	P	2.9	OPTIMA7	W820223A
7439-92-1	Lead	72.5	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-16 **Client ID:** BFD-4

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	18.3	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	51.8	mg/Kg			P	0.29	OPTIMA7	W820223A
7439-92-1	Lead	6.6	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-02 **Client ID:** RAWTP-01 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	40.6	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	820	mg/Kg			P	0.29	OPTIMA7	W820223
7439-92-1	Lead	31.2	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-01 **Client ID:** RAWTP-01 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	44.7	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	456	mg/Kg			P	0.29	OPTIMA7	W820223
7439-92-1	Lead	21.5	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-04 **Client ID:** RAWTP-03 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	14.9	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	270	mg/Kg			P	0.29	OPTIMA7	W820223
7439-92-1	Lead	11.9	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-03 **Client ID:** RAWTP-03 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	313	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	5960	mg/Kg			P	0.29	OPTIMA7	W820223
7439-92-1	Lead	147	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-05 **Client ID:** RAWTP-03 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	34.5	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	830	mg/Kg			P	0.29	OPTIMA7	W820223
7439-92-1	Lead	19.9	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-06 **Client ID:** RAWTP-03 3'-4'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	7.1	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	78.7	mg/Kg			P	0.29	OPTIMA7	W820223
7439-92-1	Lead	10.1	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-12 **Client ID:** RAWTP-04 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	400	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	18700	mg/Kg		D	P	29.0	OPTIMA7	W820223A
7439-92-1	Lead	169	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-11 **Client ID:** RAWTP-04 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	626	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	29400	mg/Kg		D	P	29.0	OPTIMA7	W820223A
7439-92-1	Lead	279	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-13 **Client ID:** RAWTP-04 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	55.8	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	1330	mg/Kg			P	0.29	OPTIMA7	W820223A
7439-92-1	Lead	18.7	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-15 **Client ID:** RAWTP-05 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	23.9	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	149	mg/Kg			P	0.29	OPTIMA7	W820223A
7439-92-1	Lead	10.4	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-14 **Client ID:** RAWTP-05 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	37.2	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	378	mg/Kg			P	0.29	OPTIMA7	W820223A
7439-92-1	Lead	17.0	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-18 **Client ID:** RAWTP-06 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	108	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	992	mg/Kg			P	0.29	OPTIMA7	W820223A
7439-92-1	Lead	29.2	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-17 **Client ID:** RAWTP-06 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	521	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	18600	mg/Kg		D	P	29.0	OPTIMA7	W820223A
7439-92-1	Lead	322	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-19 **Client ID:** RAWTP-06 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	52.4	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	334	mg/Kg			P	0.29	OPTIMA7	W820223A
7439-92-1	Lead	9.7	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-20 **Client ID:** RAWTP-06 3'-4'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	20.7	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	47.8	mg/Kg			P	0.29	OPTIMA7	W820223A
7439-92-1	Lead	7.0	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-08 **Client ID:** RAWTP-17 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	958	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	10100	mg/Kg		D	P	29.0	OPTIMA7	W820223A
7439-92-1	Lead	221	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-07 **Client ID:** RAWTP-17 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	2900	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	48800	mg/Kg		D	P	29.0	OPTIMA7	W820223A
7439-92-1	Lead	822	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-09 **Client ID:** RAWTP-17 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	1250	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	26600	mg/Kg		D	P	29.0	OPTIMA7	W820223A
7439-92-1	Lead	348	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802148
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV					**Source:** 08E0067				
	Arsenic	1989.69	2000.0	99	90.0 - 110.0	P	5/19/2008	15:52	W820223
	Copper	1995.10	2000.0	100	90.0 - 110.0	P	5/19/2008	15:52	W820223
	Lead	2008.24	2000.0	100	90.0 - 110.0	P	5/19/2008	15:52	W820223
ICV					**Source:** 08E0067				
	Arsenic	2049.01	2000.0	102	90.0 - 110.0	P	5/19/2008	15:59	W820223
	Copper	2016.58	2000.0	101	90.0 - 110.0	P	5/19/2008	15:59	W820223
	Lead	2044.08	2000.0	102	90.0 - 110.0	P	5/19/2008	15:59	W820223
CCV					**Source:** 08E0067				
	Arsenic	2030.81	2000.0	102	90.0 - 110.0	P	5/19/2008	16:26	W820223
	Copper	1997.69	2000.0	100	90.0 - 110.0	P	5/19/2008	16:26	W820223
	Lead	2014.22	2000.0	101	90.0 - 110.0	P	5/19/2008	16:26	W820223
CCV					**Source:** 08E0067				
	Arsenic	1992.31	2000.0	100	90.0 - 110.0	P	5/19/2008	17:34	W820223
	Copper	2029.08	2000.0	101	90.0 - 110.0	P	5/19/2008	17:34	W820223
	Lead	1999.88	2000.0	100	90.0 - 110.0	P	5/19/2008	17:34	W820223
CCV					**Source:** 08E0067				
	Arsenic	1943.11	2000.0	97	90.0 - 110.0	P	5/19/2008	18:40	W820223
	Copper	2028.76	2000.0	101	90.0 - 110.0	P	5/19/2008	18:40	W820223
	Lead	1993.45	2000.0	100	90.0 - 110.0	P	5/19/2008	18:40	W820223
CCV					**Source:** 08E0067				
	Arsenic	1966.38	2000.0	98	90.0 - 110.0	P	5/19/2008	19:21	W820223
	Copper	2050.02	2000.0	103	90.0 - 110.0	P	5/19/2008	19:21	W820223
	Lead	2002.40	2000.0	100	90.0 - 110.0	P	5/19/2008	19:21	W820223
ICV					**Source:** 08E0067				
	Copper	2004.55	2000.0	100	90.0 - 110.0	P	5/20/2008	07:50	W820223A
CCV					**Source:** 08E0067				
	Copper	1983.05	2000.0	99	90.0 - 110.0	P	5/20/2008	08:16	W820223A

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV					**Source:** 08E0067				
	Copper	1995.86	2000.0	100	90.0 - 110.0	P	5/20/2008	09:32	W820223A
CCV					**Source:** 08E0067				
	Copper	2001.73	2000.0	100	90.0 - 110.0	P	5/20/2008	10:05	W820223A

- 2b -
CRDL STANDARD FOR AA & ICP

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Advisory Limits (%R)	M	Analysis Date	Analysis Time	Run Number
CRI					**Source:** 08E0089				
	Arsenic	26.98	25.0	108	50 - 150	P	5/19/2008	16:09	W820223
	Copper	9.77	10.0	98	50 - 150	P	5/19/2008	16:09	W820223
	Lead	7.92	7.5	106	50 - 150	P	5/19/2008	16:09	W820223
CRI					**Source:** 08E0089				
	Copper	10.82	10.0	108	50 - 150	P	5/20/2008	08:00	W820223A

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/19/2008	16:04	W820223
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/19/2008	16:04	W820223
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/19/2008	16:04	W820223
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/19/2008	16:31	W820223
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/19/2008	16:31	W820223
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/19/2008	16:31	W820223
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/19/2008	17:39	W820223
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/19/2008	17:39	W820223
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/19/2008	17:39	W820223
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/19/2008	18:48	W820223
	Copper	5.895	+/-10.000	J	5.800	10.000	P	5/19/2008	18:48	W820223
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/19/2008	18:48	W820223
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/19/2008	19:26	W820223
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/19/2008	19:26	W820223
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/19/2008	19:26	W820223
ICB										
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/20/2008	07:54	W820223A
CCB										
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/20/2008	08:21	W820223A
CCB										
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/20/2008	09:37	W820223A

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/20/2008	10:09	W820223A

- 3b -
PREPARATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result (mg/Kg)	Conc Qual	Q	Acceptance Limit	MDL	PQL	M	Analysis Date	Analysis Time	Run
PBS			**SOIL**								
	Arsenic	0.710U			+/-0.710	0.710	2.500	P	5/19/2008	16:36	W820223
	Copper	0.290U			+/-0.290	0.290	1.000	P	5/19/2008	16:36	W820223
	Lead	0.230U			+/-0.230	0.230	0.750	P	5/19/2008	16:36	W820223

- 4 -

INTERFERENCE CHECK SAMPLE

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window	Analysis Date	Analysis Time	Run Number
ICSA					**Source:** 08E0109/08E0110			
	Arsenic	12.1				5/19/2008	16:15	W820223
	Copper	10700	10000	107	80 - 120%	5/19/2008	16:15	W820223
	Lead	18.4				5/19/2008	16:15	W820223
ICSAB					**Source:** 08E0109/08E0110			
	Arsenic	507	500	101	80 - 120%	5/19/2008	16:20	W820223
	Copper	538	500	108	80 - 120%	5/19/2008	16:20	W820223
	Lead	464	500	93	80 - 120%	5/19/2008	16:20	W820223
ICSA					**Source:** 08E0109/08E0110			
	Copper	10700	10000	107	80 - 120%	5/20/2008	08:06	W820223A
ICSAB					**Source:** 08E0109/08E0110			
	Copper	551	500	110	80 - 120%	5/20/2008	08:11	W820223A

- 5a -

MATRIX SPIKE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802148-01 **Client ID:** RAWTP-01 2"-1'MS1

Percent Solids for Sample: 100.00 **Spiked ID:** W820223-MS1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	140.0872		44.6970		100.00	95		P
Copper	mg/Kg	75 - 125	568.7153		456.2098		100.00	113		P
Lead	mg/Kg	75 - 125	115.7996		21.5206		100.00	94		P

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802148-01 **Client ID:** RAWTP-01 2"-1'MSD1

Percent Solids for Sample: 100.00 **Spiked ID:** W820223-MSD1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	137.9398		44.6970		100.00	93		P
Copper	mg/Kg	75 - 125	557.2997		456.2098		100.00	101		P
Lead	mg/Kg	75 - 125	114.2358		21.5206		100.00	93		P

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W820223-MS1 **Client ID:** RAWTP-01 2"-1'MSD1

Percent Solids for Sample: 100.00 **Duplicate ID:** W820223-MSD1 **Percent Solids for Duplicate:** 100.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	mg/Kg		140.0872		137.9398		2		P
Copper	mg/Kg		568.7153		557.2997		2		P
Lead	mg/Kg		115.7996		114.2358		1		P

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSS			**LCS Source:**	**QC19115SCSN**			**Batch Number:**	**3050B-05152**
	Arsenic	mg/Kg	100.0	95.4		95	80.0 - 120.0	P
	Copper	mg/Kg	100.0	101.5		102	80.0 - 120.0	P
	Lead	mg/Kg	100.0	98.0		98	80.0 - 120.0	P

- 10 -
METHOD DETECTION LIMITS

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Analyte	Wave- length (nm)	MDL	PQL
OPTIMA7			**Date:** 3/20/2008
OPT7 GOLDER			
Arsenic Soil	188.979	7.1	25
Copper Soil	324.752	2.9	10
Lead Soil	220.353	2.3	7.5
Arsenic Water	188.979	8.8	25
Copper Water	324.752	5.8	10
Lead Water	220.353	2.7	7.5

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	Ag
Aluminum	308.22	0.0000000	0.0207190	0.0120300	-0.0515205	-4.9158802
Antimony	206.84	-0.0267947	-0.0235140	-0.0652917	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0026736	0.0617380	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0064810	-0.0021755	0.1105640	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0086530	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0128574	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0136640	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0719449	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.3618530	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0463195	0.0339874	0.0000000
Nickel	232.00	-0.0108972	-0.0086700	-0.2357930	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0671620	0.0000000	-0.0735814	0.0000000	0.0000000
Silver	328.07	0.0080000	0.0026432	-0.0431800	-0.0009512	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0159040	-0.0255790	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0196000	0.0000000	0.0000000
Zinc	206.20	0.0147479	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: As	B	Be	Cd	Co
Aluminum	308.22	-0.7712260	0.0000000	1.9230000	0.0000000	-8.4645996
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	-0.0452534
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0061070	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	-0.3502000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	2.2788999
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.6054300
Nickel	232.00	0.0000000	0.0000000	-0.4082000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	-0.0666463	0.0000000	0.0000000	-0.0206171
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	4.5946798
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.2605720	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Cr	Cu	Li	Mn	Mo
Aluminum	308.22	0.0000000	0.5861200	0.2252000	0.5555770	20.0904007
Antimony	206.84	5.5828600	0.0000000	0.0000000	0.0000000	-3.6831999
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	-0.1127460	0.0000000	0.0000000	0.0218515	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0613697
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	1.5008000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	-1.6574301
Cobalt	228.62	-0.1267530	0.0000000	0.0000000	0.0706386	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.5458750
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	-2.2182000	0.3641500	0.0000000	0.0915702	-0.2396000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	-1.5451100	0.0000000
Manganese	260.57	-0.1219760	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	13.8179998	-0.3078670	0.0000000	0.2056650	3.0824201
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	1.2911400	0.0000000
Silver	328.07	0.0000000	0.0327636	-0.0306730	0.1590960	0.0713769
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.3364670	0.0000000	0.0000000	-1.7416400	-0.5289330
Vanadium	292.40	-4.4160600	-0.0520540	0.0000000	-0.1773900	-0.4541660
Zinc	206.20	-1.5611300	0.0000000	0.0000000	0.3653180	0.8787460

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Na	Ni	Pb	Sb	Se
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0476335	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0648597	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.1080310	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.1204100	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	-0.2269880	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0048533	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.6535250	0.3507140

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Si	Sn	Sr	Ti	Tl
Aluminum	308.22	0.0000000	0.0000000	-3.8224199	2.0929599	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.5032240	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.1360430	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.1393840	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	2.0177901	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	-0.7596230	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	-0.0080177	-0.0100551	-0.0782215	0.0000000	-0.0094611
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	-1.9865000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.7094510	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.2964610

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: U	V	Zn	La	
Aluminum	308.22	-8.4760399	-10.4483004	-0.3308580	0.1640000	
Antimony	206.84	-1.1049000	0.0000000	0.0000000	0.0000000	
Arsenic	188.98	0.0000000	0.0000000	0.0000000	55.5082016	
Barium	233.53	-0.0388368	0.1318340	0.0000000	0.0000000	
Beryllium	313.11	-0.0741906	0.0000000	0.0000000	0.0000000	
Cadmium	226.50	-0.0501594	0.0000000	0.0000000	-0.1327000	
Calcium	315.89	2.6055901	-3.5826399	0.0000000	0.0000000	
Chromium	267.72	-1.0719800	0.1526560	0.0000000	0.0000000	
Cobalt	228.62	0.1274260	0.0000000	0.0000000	0.0000000	
Copper	324.75	0.5231330	-0.2011560	0.0000000	0.0000000	
Iron	273.96	-1.1845200	4.1059599	0.0000000	0.0000000	
Lead	220.35	1.2635400	0.0000000	0.0000000	0.4454000	
Magnesium	279.08	-12.8909998	0.0000000	0.0000000	0.0000000	
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	
Nickel	232.00	0.0000000	0.0000000	0.1456010	-20.4916000	
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	
Selenium	196.03	0.0000000	0.0000000	0.0000000	-4.0792599	
Silver	328.07	0.7184970	-0.1259390	0.0000000	-0.0451447	
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	
Thallium	190.80	0.0000000	2.5700600	0.0000000	0.0000000	
Vanadium	292.40	-1.5207601	0.0000000	0.0000000	0.9598270	
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 3/19/2008

Analyte	Integration Time (sec)	LDR ug/L	
Arsenic	20.00	50000	OPT7 GOLDER
Copper	20.00	90000	OPT7 GOLDER
Lead	20.00	100000	OPT7 GOLDER

- 13 -
SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802148

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number: 3050B-05152008	**Method:** P						
PBS	PBS	MB	SOIL	5/15/08	1.00	100.0	100.00
LCSS	LCSS	LCS	SOIL	5/15/08	1.00	100.0	100.00
W802148-01	RAWTP-01 2"-1'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W820223-MS1	RAWTP-01 2"-1'MS1	MS	SOIL	5/15/08	1.00	100.0	100.00
W820223-MSD1	RAWTP-01 2"-1'MSD1	MSD	SOIL	5/15/08	1.00	100.0	100.00
W802148-02	RAWTP-01 1'-2'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-03	RAWTP-03 2"-1'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-04	RAWTP-03 1'-2'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-05	RAWTP-03 2'-3'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-06	RAWTP-03 3'-4'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-07	RAWTP-17 2"-1'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-08	RAWTP-17 1'-2'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-09	RAWTP-17 2'-3'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-10	BFD-10	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-11	RAWTP-04 2"-1'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-12	RAWTP-04 1'-2'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-13	RAWTP-04 2'-3'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-14	RAWTP-05 2"-1'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-15	RAWTP-05 1'-2'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-16	BFD-4	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-17	RAWTP-06 2"-1'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-18	RAWTP-06 1'-2'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-19	RAWTP-06 2'-3'	SAM	SOIL	5/15/08	1.00	100.0	100.00
W802148-20	RAWTP-06 3'-4'	SAM	SOIL	5/15/08	1.00	100.0	100.00

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802148

Instrument ID Number: OPTIMA7 Method: P Run Number: W820223

Start Date: 5/19/2008 End Date: 5/19/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN			
CALIB BLANK 1	1.00	1524				X							X		X															
STD1	1.00	1530				X							X		X															
STD2	1.00	1535																												
STD3	1.00	1540																												
STD4	1.00	1544																												
STD5	1.00	1548																												
ICV	1.00	1552				X							X		X															
ICV	1.00	1559				X							X		X															
ICB	1.00	1604				X							X		X															
CRI	1.00	1609				X							X		X															
ICSA	1.00	1615				X							X		X															
ICSAB	1.00	1620				X							X		X															
CCV	1.00	1626				X							X		X															
CCB	1.00	1631				X							X		X															
PBS	1.00	1636				X							X		X															
LCSS	1.00	1642				X							X		X															
RAWTP-01 2"-1'	1.00	1647				X							X		X															
RAWTP-01 2"-1'MS1	1.00	1652				X							X		X															
RAWTP-01 2"-1'MSD1	1.00	1700				X							X		X															
RAWTP-01 1'-2'	1.00	1706				X							X		X															
RAWTP-03 2"-1'	1.00	1712				X							X		X															
RAWTP-03 1'-2'	1.00	1717				X							X		X															
RAWTP-03 2'-3'	1.00	1722				X							X		X															
RAWTP-03 3'-4'	1.00	1728				X							X		X															
CCV	1.00	1734				X							X		X															
CCB	1.00	1739				X							X		X															
RAWTP-17 2"-1'	1.00	1744				X									X															
RAWTP-17 1'-2'	1.00	1749				X									X															
RAWTP-17 2'-3'	1.00	1755				X									X															
BFD-10	1.00	1800				X									X															
RAWTP-04 2"-1'	1.00	1805				X									X															
RAWTP-04 1'-2'	1.00	1811				X									X															
RAWTP-04 2'-3'	1.00	1817				X									X															
RAWTP-05 2"-1'	1.00	1822				X									X															
RAWTP-05 1'-2'	1.00	1828				X									X															
BFD-4	1.00	1834				X									X															

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802148

Instrument ID Number: OPTIMA7 Method: P Run Number: W820223

Start Date: 5/19/2008 End Date: 5/19/2008

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CCV	1.00	1840				X							X		X												
CCB	1.00	1848				X							X		X												
RAWTP-06 2"-1'	1.00	1854				X									X												
RAWTP-06 1'-2'	1.00	1859				X									X												
RAWTP-06 2'-3'	1.00	1904				X									X												
RAWTP-06 3'-4'	1.00	1910				X									X												
RAWTP-17 2"-1'	50.00	1916																									
CCV	1.00	1921				X							X		X												
CCB	1.00	1926				X							X		X												

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802148

Instrument ID Number: OPTIMA7 Method: P Run Number: W820223A

Start Date: 5/20/2008 End Date: 5/20/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CALIB BLANK 1	1.00	0722											X														
STD1	1.00	0728											X														
STD2	1.00	0733																									
STD3	1.00	0737																									
STD4	1.00	0742																									
STD5	1.00	0746																									
ICV	1.00	0750											X														
ICB	1.00	0754											X														
CRI	1.00	0800											X														
ICSA	1.00	0806											X														
ICSAB	1.00	0811											X														
CCV	1.00	0816											X														
CCB	1.00	0821											X														
RAWTP-17 2"-1'	100.00	0837											X														
RAWTP-17 1'-2'	100.00	0843											X														
RAWTP-17 2'-3'	100.00	0848											X														
BFD-10	10.00	0853											X														
RAWTP-04 2"-1'	100.00	0859											X														
RAWTP-04 1'-2'	100.00	0904											X														
RAWTP-04 2'-3'	1.00	0909											X														
RAWTP-05 2"-1'	1.00	0915											X														
RAWTP-05 1'-2'	1.00	0920											X														
BFD-4	1.00	0926											X														
CCV	1.00	0932											X														
CCB	1.00	0937											X														
RAWTP-06 2"-1'	100.00	0942											X														
RAWTP-06 1'-2'	1.00	0947											X														
RAWTP-06 2'-3'	1.00	0953											X														
RAWTP-06 3'-4'	1.00	0959											X														
CCV	1.00	1005											X														
CCB	1.00	1009											X														

October 07, 2011

Dr. Casey McKeon
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

RE: ITSI DATA VALIDATION REPORT
RESOLUTION COPPER MINING
HUMAN HEALTH RISK ASSESSMENT
SDG W802148

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) has completed the data review for Resolution Copper Mining (RCM) for its Human Health Risk Assessment (HHRA) soil samples collected in 2008. ITSI performed data review as described in the U.S. Environmental Protection Agency's (EPA) *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004; and the *Sampling and Analysis Plan (SAP) for Clean Closure at Resolution Copper Mining Limited (Resolution), West Plant Site, Superior Mine* , (Golder, June 2005).

The acronym and abbreviations list is included as Appendix A. Data review qualifiers have been marked in red directly on the analytical reports provided by the laboratory and are attached as Appendix B. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C. A summary of the field duplicate pair results is provided in the Field Duplicate Table as Appendix D. Client communications are provided as Appendix E. The ITSI standard legal notice is provided as Appendix F.

1.0 CROSS REFERENCE OF SAMPLES VERIFIED

The analytical data presented in the laboratory Sample Delivery Group (SDG) listed in Table 1 underwent an EPA Level III data validation. The Level III data validation is equivalent to a Step 2A validation, manual (S2AVM) as defined in the *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009). The SDGs contained data for arsenic, copper and lead by EPA Method 6010B.

1501 West Fountainhead Parkway, Suite 350
Tempe, Arizona 85282

(480) 706-6488
fax (480) 704-2952
www.itsi.com

The primary analytical laboratory was SVL of Kellogg, Idaho. Table 1 below provides an analytical summary and cross reference for the samples.

Table 1 Analytical Summary and Cross Reference for Method 6010B

Client Sample ID	Laboratory SDG Number	Date Sampled	Type
RAWTP-01 2"-1'	W802148-01	5/01/2008	MS/MSD
RAWTP-01 1'-2'	W802148-02	5/01/2008	
RAWTP-03 2"-1'	W802148-03	4/30/2008	PS 1
RAWTP-03 1'-2'	W802148-04	4/30/2008	
RAWTP-03 2'-3'	W802148-05	4/30/2008	
RAWTP-03 3'-4'	W802148-06	4/30/2008	
RAWTP-17 2"-1'	W802148-07	4/30/2008	
RAWTP-17 1'-2'	W802148-08	4/30/2008	
RAWTP-17 2'-3'	W802148-09	4/30/2008	
BFD-10	W802148-10	4/30/2008	FD 1
RAWTP-04 2"-1'	W802148-11	5/01/2008	
RAWTP-04 1'-2'	W802148-12	5/01/2008	
RAWTP-04 2'-3'	W802148-13	5/01/2008	
RAWTP-05 2"-1'	W802148-14	5/01/2008	
RAWTP-05 1'-2'	W802148-15	5/01/2008	
BFD-4	W802148-16	5/01/2008	FD 2
RAWTP-06 2"-1'	W802148-17	5/01/2008	
RAWTP-06 1'-2'	W802148-18	5/01/2008	
RAWTP-06 2'-3'	W802148-19	5/01/2008	
RAWTP-06 3'-4'	W802148-20	5/01/2008	PS 2

FD = Field duplicate sample
MS/MSD = matrix spike/matrix spike duplicate
PS = Parent sample of field duplicate

The EPA S2AVM data validation included review of the report from the laboratory equivalent to an abbreviated EPA Level III data deliverable with standardized EPA forms. Level III data deliverables contain the sample results and chain-of-custody forms along with basic Quality Control (QC) summaries including surrogate recoveries, method blank results, and precision and accuracy data summaries for the sample preparation batch. As discussed in Section 2.0 below, the laboratory did not include any comments in the case narrative addressing any QC problems.

2.0 LABORATORY REPORT

The data were reported by the laboratory as an EPA Level III deliverable with standardized EPA forms. The data qualifiers noted by the laboratory in the report were reviewed. Anomalies that required data qualification, if any, are discussed in the sections below. Since the laboratory did not include a case narrative in the report, only the quality

control anomalies from the Level III data deliverable could be addressed. Also, there was no official laboratory signature authorizing the release of the report or issue date. ITSI advises that all laboratory reports received by the client contain an official signature authorizing the release of the report and that the issue date should be documented on the report. In addition, the laboratory should provide an officially signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

3.0 SAMPLE INTEGRITY

The Chains-of-Custody (COC) for the April 30 and May 01, 2008 sampling event were available for review. There were no anomalies that required qualification of the data, however, the following COC anomaly was observed.

- The transfer of the samples to the shipping carrier was not documented on the COC. The client indicated that the samplers shipped the samples to SVL via FedEx. ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number. A copy of the communication with the client verifying the transfer of samples to FedEx is provided in Appendix E.

4.0 HOLDING TIME

The samples were analyzed within the recommended method holding time of 180 days after collection.

5.0 INITIAL AND CONTINUING CALIBRATION

The initial and continuing calibrations were not reviewed for this level of validation.

6.0 BLANK EVALUATION

Preparation and equipment blanks were reviewed. The equipment blank(s) associated with the samples are listed in the Data Validation Report (DVR) for SDG W802216. There were no compounds detected in any of the blanks that required qualification of the data.

7.0 LABORATORY CONTROL SAMPLE

A laboratory control sample (LCS) was reported for each analysis. QC results were reviewed using the control limits listed in Table C6 of the SAP. There were no LCS anomalies that required qualification of the data.

8.0 MATRIX SPIKE AND MATRIX SPIKE DUPLICATE

The project matrix spike/matrix spike duplicate (MS/MSD) pair was reviewed using the laboratory control limits of 75 to 125 percent for accuracy and 20 relative percent difference (RPD) for precision. The sample used as the MS/MSD pair is identified in Table 1. There were no MS/MSD anomalies that required qualification of the data.

9.0 REPORTING LIMIT SPIKES

Spikes prepared at the laboratory's reporting limit were reviewed. There were no reporting limit spike anomalies that required qualification of the data.

10.0 COMPOUND QUANTITATION AND IDENTIFICATION

The laboratory reporting limits and quantitative results were reviewed. All reporting limits met the Client Required Detection Limits (CRDLs) listed in the SAP. There were no quantitative anomalies that required qualification of the data, however, the following observation was made.

- There were no units listed on reporting Form 10 for the instrument method detection limits (MDLs) and practical quantitation limits (PQLs) provided with the data package. To provide traceability of laboratory reporting limits from the instrument to the reported data, the laboratory is advised to list the MDL and PQL units on all reporting forms.

11.0 FIELD DUPLICATE SAMPLES

Field duplicate sets were collected and analyzed to measure field and laboratory precision. The results of the field duplicate and parent samples were compared and are summarized in the Field Duplicate Table presented as Appendix D. All field duplicate results were acceptable except as noted below.

- The relative percent differences (RPDs) for arsenic, copper and lead were out of the control limit of 35 percent in the field duplicate set RAWTP-03 2"-1' / BFD-

10. The associated results in the duplicate set have been qualified as "J" for an estimated value.

12.0 RECOMMENDATIONS

ITSI recommends the following actions.

- ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number.

- ITSI advises that all laboratory reports must contain an official signature authorizing the release of the report and that the issue date be documented on the report. Also, the laboratory should provide a properly signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

- ITSI advises the laboratory to list the MDL and PQL units on all reporting forms to provide traceability of laboratory reporting limits from the instrument to the reported data.

13.0 OVERALL ASSESSMENT FOR RCM HHRA APRIL 30 AND MAY 01, 2008 SAMPLING EVENT

There were no rejected results for this sampling event. Based on the available information, the data as qualified are considered useable for their intended purposes. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C.

We thank you for the opportunity to serve you and look forward to supporting RCM with data review in the future.

Sincerely,

Innovative Technical Solutions, Inc.

Evelyn Dawson, CHMM

Program Chemist

Enclosures:

Appendix A – List of Acronyms and Abbreviations
Appendix B – Qualified Report Pages
Appendix C – Qualified Results Table
Appendix D – Field Duplicate Table
Appendix E – Client Communication
Appendix F – ITSI Standard Legal Notice

cc: John Malusa
Golder Associates, Inc.
4730 North Oracle Road, Suite 210
Tucson, Arizona, 85705

APPENDIX A

LIST OF ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS AND ABBREVIATIONS

COC	chain-of-custody
CRDL	Client Required Detection Limits
EPA	U.S. Environmental Protection Agency
FD	field duplicate
HHRA	Human Health Risk Assessment
ITSI	Innovative Technical Solutions, Inc.
LCS	laboratory control spike
MDL	method detection limits
MS/MSD	matrix spike/matrix spike duplicate
PQL	practical quantitation limits
PS	parent sample
QC	quality control
QRT	Qualified Results Table
RPD	relative percent difference
RCM	Resolution Copper Mining
SAP	Sample Analysis Plan
S2AVM	Step 2A validation, manual
SDG	Sample Delivery Group

APPENDIX B

QUALIFIED REPORT PAGES

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-03 **Client ID:** RAWTP-03 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	313 J	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	5960 J	mg/Kg			P	0.29	OPTIMA7	W820223
7439-92-1	Lead	147 J	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

PGC ITSI
30Sep2011

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802148 **Method Type:**

Sample ID: W802148-10 **Client ID:** BFD-10

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	171 J	mg/Kg			P	0.71	OPTIMA7	W820223
7440-50-8	Copper	2690 J	mg/Kg		D	P	2.9	OPTIMA7	W820223A
7439-92-1	Lead	72.5 J	mg/Kg			P	0.23	OPTIMA7	W820223

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

PGC ITSI

30Sep2011

APPENDIX C

QUALIFIED RESULTS TABLE

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Parameter	Original Value	Added Qualifier	New Value	PQL	MDL	Units	Reason	Validator
W802148-03	RAWTP-03 2"-1'	04/30/08	Soil	EPA 6010B	Arsenic	313	J	313 J	2.5	0.71	mg/kg	RPD FD	PGC/EHD
W802148-03	RAWTP-03 2"-1'	04/30/08	Soil	EPA 6010B	Copper	5960	J	5960 J	1	0.29	mg/kg	RPD FD	PGC/EHD
W802148-03	RAWTP-03 2"-1'	04/30/08	Soil	EPA 6010B	Lead	147	J	147 J	0.75	0.23	mg/kg	RPD FD	PGC/EHD
W802148-10	BFD-10	04/30/08	Soil	EPA 6010B	Arsenic	171	J	171 J	2.5	0.71	mg/kg	RPD FD	PGC/EHD
W802148-10	BFD-10	04/30/08	Soil	EPA 6010B	Copper	2690	J	2690 J	10	0.29	mg/kg	RPD FD	PGC/EHD
W802148-10	BFD-10	04/30/08	Soil	EPA 6010B	Lead	72.5	J	72.5 J	0.75	0.23	mg/kg	RPD FD	PGC/EHD

Notes

J = estimated value
mg/kg = milligrams per kilogram

FD = field duplicate
MDL = method detection limit
PQL = Practical Quantitation Limit
RPD = relative percent difference

APPENDIX D

FIELD DUPLICATE TABLE

Field Duplicate Results
Resolution Copper Mining
Human Health Risk Assessment

Client ID Primary/FD	Laboratory ID Primary/FD	Metal	Sample mg/kg	Duplicate mg/kg	RPD	Agreement (Yes) Non-agreement (No)
RAWTP-03 2"-1' / BFD-10	W802148-03 / 10	Arsenic	313	171	59%	No
RAWTP-03 2"-1' / BFD-10	W802148-03 / 10	Copper	5960	2690	76%	No
RAWTP-03 2"-1' / BFD-10	W802148-03 / 10	Lead	147	72.5	68%	No
RAWTP-06 3'-4' / BFD-4	W802148-20 / 16	Arsenic	20.7	18.3	12%	Yes
RAWTP-06 3'-4' / BFD-4	W802148-20 / 16	Copper	47.8	51.8	8%	Yes
RAWTP-06 3'-4' / BFD-4	W802148-20 / 16	Lead	7	6.6	6%	Yes

Notes
mg/kg = milligrams per kilogram
FD = field duplicate
No = RPD greater than control limit of 35
Yes = RPD less than control limit of 35
RPD = relative percent difference

APPENDIX E

CLIENT COMMUNICATION

Peggy Cota

From: Morfin, Orestes <Orestes_Morfin@golder.com>
Sent: Tuesday, September 27, 2011 1:52 PM
To: Peggy Cota; Evelyn Dawson
Cc: Malusa, John
Subject: 2008 RAWTP sample shipping

Hello Peggy and Evelyn,
I received an e-mail today from Alejandra Bonilla, one of the two field crew who collected the 2008 RAWTP samples. She confirmed that the samples were shipped to SVL via FedEx.
I hope that helps.
Sincerely,
Orestes

Orestes Morfín (M.Sc.)| Project Hydrogeochemist | **Golder Associates Ltd.**
102, 2535 - 3rd Avenue S.E., Calgary, Alberta, Canada T2A 7W5
T: +1 (403) 299 5600 | **D:** +1 403 513-3574 | **F:** +1 (403) 299-5606 | **C:** +1 | **E:** Orestes_Morfin@golder.com | **www.golder.com**

Work Safe, Home Safe

APPENDIX F

ITSI STANDARD LEGAL NOTICE

ITSI STANDARD LEGAL NOTICE

ITSI is issuing this report at the request of the Client and based upon information furnished by Client. Further, the presence of environmental contamination can be influenced by many factors, including unknown and changing underground conditions. Therefore: 1. This report may not be relied upon by anyone for financial decision-making. 2. No one other than Client is authorized to use this report for any purpose. 3. Any conclusions or opinions included in this report are subject to reasonable revision based upon any new environmental or other data which is later developed. 4. Any results or conclusions stated are to be considered limited by the quality of the underlying sample or other data on which they are based, the budget established by the Client or otherwise for gathering and analyzing data, and by any assumptions and qualifications contained within this report.

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802166 **Method Type:** **SOW No.:** SW846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802166-01	RAWTP-07 2"-1'	
W802166-02	RAWTP-07 1'-2'	
W802166-03	RAWTP-07 2'-3'	
W802166-04	BFD-05	
W802166-05	RAWTP-08 2"-1'	
W802166-06	RAWTP-08 1'-2'	
W802166-07	RAWTP-08 2'-3'	
W802166-08	RAWTP-08 3'-4'	
W802166-09	RAWTP-09 2"-1'	
W802166-10	RAWTP-09 1'-2'	
W802166-11	RAWTP-09 2'-3'	
W802166-12	RAWTP-09 3'-4'	
W802166-13	RAWTP-10 2"-1'	
W802166-14	RAWTP-10 1'-2'	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802166 **Method Type:** **SOW No.:** SW846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802166-15	RAWTP-10 2'-3'	
W802166-16	RAWTP-12 2"-1'	
W802166-17	RAWTP-12 1'-2'	
W802166-18	RAWTP-12 2'-3'	
W802166-19	RAWTP-12 3'-4'	
W802166-20	BFD-08	
W820288-MS1	RAWTP-07 2"-1'MS	Matrix Spike
W820288-MSD1	RAWTP-07 2"-1'MSD	Matrix Spike Duplicate

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-04 **Client ID:** BFD-05

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	7.6	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	37.1	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	7.4	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-20 **Client ID:** BFD-08

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	9.7	mg/Kg			P	0.71	OPTIMA5	W820288A
7440-50-8	Copper	108	mg/Kg			P	0.29	OPTIMA5	W820288A
7439-92-1	Lead	10.4	mg/Kg			P	0.23	OPTIMA5	W820288A

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-02 **Client ID:** RAWTP-07 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	27.5	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	32.0	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	7.9	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-01 **Client ID:** RAWTP-07 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	32.2	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	984	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	26.1	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-03 **Client ID:** RAWTP-07 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	11.3	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	57.3	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	7.4	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-06 **Client ID:** RAWTP-08 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	56.8	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	57.1	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	7.0	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-05 **Client ID:** RAWTP-08 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	49.9	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	111	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	10.4	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-07 **Client ID:** RAWTP-08 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	8.7	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	25.0	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	4.8	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-08 **Client ID:** RAWTP-08 3'-4'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	6.9	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	67.7	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	6.9	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-10 **Client ID:** RAWTP-09 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	23.1	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	518	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	18.6	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-09 **Client ID:** RAWTP-09 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	938	mg/Kg		D	P	35.5	OPTIMA7	W820288
7440-50-8	Copper	17200	mg/Kg		D	P	14.5	OPTIMA7	W820288
7439-92-1	Lead	442	mg/Kg		D	P	11.5	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-11 **Client ID:** RAWTP-09 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	54.3	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	1500	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	30.8	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-12 **Client ID:** RAWTP-09 3'-4'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	7.9	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	198	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	9.2	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-14 **Client ID:** RAWTP-10 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	63.0	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	1100	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	26.6	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-13 **Client ID:** RAWTP-10 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	1450	mg/Kg		D	P	35.5	OPTIMA7	W820288
7440-50-8	Copper	29200	mg/Kg		D	P	14.5	OPTIMA7	W820288
7439-92-1	Lead	455	mg/Kg		D	P	11.5	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-15 **Client ID:** RAWTP-10 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	458	mg/Kg		D	P	35.5	OPTIMA7	W820288
7440-50-8	Copper	8390	mg/Kg		D	P	14.5	OPTIMA7	W820288
7439-92-1	Lead	147	mg/Kg		D	P	11.5	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-17 **Client ID:** RAWTP-12 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	20.1	mg/Kg			P	0.71	OPTIMA5	W820288A
7440-50-8	Copper	227	mg/Kg			P	0.29	OPTIMA5	W820288A
7439-92-1	Lead	12.1	mg/Kg			P	0.23	OPTIMA5	W820288A

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-16 **Client ID:** RAWTP-12 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	1110	mg/Kg		D	P	35.5	OPTIMA5	W820288A
7440-50-8	Copper	10700	mg/Kg		D	P	14.5	OPTIMA5	W820288A
7439-92-1	Lead	389	mg/Kg		D	P	11.5	OPTIMA5	W820288A

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-18 **Client ID:** RAWTP-12 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	21.7	mg/Kg			P	0.71	OPTIMA5	W820288A
7440-50-8	Copper	247	mg/Kg			P	0.29	OPTIMA5	W820288A
7439-92-1	Lead	14.1	mg/Kg			P	0.23	OPTIMA5	W820288A

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-19 **Client ID:** RAWTP-12 3'-4'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	60.7	mg/Kg			P	0.71	OPTIMA5	W820288A
7440-50-8	Copper	828	mg/Kg			P	0.29	OPTIMA5	W820288A
7439-92-1	Lead	27.8	mg/Kg			P	0.23	OPTIMA5	W820288A

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802166
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV					**Source:** 08E0202/08E0153				
	Arsenic	2073.73	2000	104	90.0 - 110.0	P	5/22/2008	07:18	W820288
	Copper	2042.37	2000	102	90.0 - 110.0	P	5/22/2008	07:18	W820288
	Lead	2070.37	2000	104	90.0 - 110.0	P	5/22/2008	07:18	W820288
ICV					**Source:** 08E0202/08E0153				
	Arsenic	2086.96	2000	104	90.0 - 110.0	P	5/22/2008	07:25	W820288
	Copper	2043.83	2000	102	90.0 - 110.0	P	5/22/2008	07:25	W820288
	Lead	2081.92	2000	104	90.0 - 110.0	P	5/22/2008	07:25	W820288
CCV					**Source:** 08E0202/08E0153				
	Arsenic	2116.73	2000	106	90.0 - 110.0	P	5/22/2008	07:52	W820288
	Copper	2025.48	2000	101	90.0 - 110.0	P	5/22/2008	07:52	W820288
	Lead	2107.30	2000	105	90.0 - 110.0	P	5/22/2008	07:52	W820288
CCV					**Source:** 08E0202/08E0153				
	Arsenic	2130.79	2000	107	90.0 - 110.0	P	5/22/2008	09:21	W820288
	Copper	2018.55	2000	101	90.0 - 110.0	P	5/22/2008	09:21	W820288
	Lead	2128.14	2000	106	90.0 - 110.0	P	5/22/2008	09:21	W820288
CCV					**Source:** 08E0202/08E0153				
	Arsenic	2049.37	2000	102	90.0 - 110.0	P	5/22/2008	10:27	W820288
	Copper	1972.25	2000	99	90.0 - 110.0	P	5/22/2008	10:27	W820288
	Lead	2049.17	2000	102	90.0 - 110.0	P	5/22/2008	10:27	W820288
ICV					**Source:** 08E0202/08E0153				
	Arsenic	2078.81	2000	104	90.0 - 110.0	P	5/23/2008	08:30	W820288A
	Copper	2040.53	2000	102	90.0 - 110.0	P	5/23/2008	08:30	W820288A
	Lead	2041.26	2000	102	90.0 - 110.0	P	5/23/2008	08:30	W820288A
ICV					**Source:** 08E0202/08E0153				
	Arsenic	2008.47	2000	100	90.0 - 110.0	P	5/23/2008	08:35	W820288A
	Copper	1999.11	2000	100	90.0 - 110.0	P	5/23/2008	08:35	W820288A
	Lead	1966.90	2000	98	90.0 - 110.0	P	5/23/2008	08:35	W820288A

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802166
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV					**Source:** 08E0202/08E0153				
	Arsenic	2008.27	2000	100	90.0 - 110.0	P	5/23/2008	09:05	W820288A
	Copper	1978.90	2000	99	90.0 - 110.0	P	5/23/2008	09:05	W820288A
	Lead	1939.52	2000	97	90.0 - 110.0	P	5/23/2008	09:05	W820288A
CCV					**Source:** 08E0202/08E0153				
	Arsenic	1982.74	2000	99	90.0 - 110.0	P	5/23/2008	10:02	W820288A
	Copper	2017.07	2000	101	90.0 - 110.0	P	5/23/2008	10:02	W820288A
	Lead	1890.34	2000	95	90.0 - 110.0	P	5/23/2008	10:02	W820288A

- 2b -
CRDL STANDARD FOR AA & ICP

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Advisory Limits (%R)	M	Analysis Date	Analysis Time	Run Number
CRI					**Source:** 08E0089				
	Arsenic	27.52	25	110	50 - 150	P	5/22/2008	07:35	W820288
	Copper	10.92	10	109	50 - 150	P	5/22/2008	07:35	W820288
	Lead	7.28	7.5	97	50 - 150	P	5/22/2008	07:35	W820288
CRI					**Source:** 08E0089				
	Arsenic	30.92	25	124	50 - 150	P	5/23/2008	08:47	W820288A
	Copper	9.88	10	99	50 - 150	P	5/23/2008	08:47	W820288A
	Lead	8.02	7.5	107	50 - 150	P	5/23/2008	08:47	W820288A

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/22/2008	07:30	W820288
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/22/2008	07:30	W820288
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/22/2008	07:30	W820288
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/22/2008	07:57	W820288
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/22/2008	07:57	W820288
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/22/2008	07:57	W820288
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/22/2008	09:27	W820288
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/22/2008	09:27	W820288
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/22/2008	09:27	W820288
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/22/2008	10:32	W820288
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/22/2008	10:32	W820288
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/22/2008	10:32	W820288
ICB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/23/2008	08:42	W820288A
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/23/2008	08:42	W820288A
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/23/2008	08:42	W820288A
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/23/2008	09:12	W820288A
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/23/2008	09:12	W820288A
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/23/2008	09:12	W820288A

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/23/2008	10:08	W820288A
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/23/2008	10:08	W820288A
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/23/2008	10:08	W820288A

- 3b -
PREPARATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result (mg/Kg)	Conc Qual	Q	Acceptance Limit	MDL	PQL	M	Analysis Date	Analysis Time	Run
PBS			**SOIL**								
	Arsenic	0.710U			+/-0.710	0.710	2.500	P	5/22/2008	08:25	W820288
	Copper	0.290U			+/-0.290	0.290	1.000	P	5/22/2008	08:25	W820288
	Lead	0.230U			+/-0.230	0.230	0.750	P	5/22/2008	08:25	W820288

- 4 -

INTERFERENCE CHECK SAMPLE

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window	Analysis Date	Analysis Time	Run Number
ICSA					**Source:** 08E0109/08E0110			
	Arsenic	10.0				5/22/2008	07:41	W820288
	Copper	10300	10000	103	80 - 120%	5/22/2008	07:41	W820288
	Lead	11.0				5/22/2008	07:41	W820288
ICSAB					**Source:** 08E0109/08E0110			
	Arsenic	504	500	101	80 - 120%	5/22/2008	07:46	W820288
	Copper	515	500	103	80 - 120%	5/22/2008	07:46	W820288
	Lead	451	500	90	80 - 120%	5/22/2008	07:46	W820288
ICSA					**Source:** 08E0109/08E0110			
	Arsenic	9.2				5/23/2008	08:53	W820288A
	Copper	12000	10000	120	80 - 120%	5/23/2008	08:53	W820288A
	Lead	5.7				5/23/2008	08:53	W820288A
ICSAB					**Source:** 08E0109/08E0110			
	Arsenic	519	500	104	80 - 120%	5/23/2008	08:59	W820288A
	Copper	593	500	119	80 - 120%	5/23/2008	08:59	W820288A
	Lead	486	500	97	80 - 120%	5/23/2008	08:59	W820288A

- 5a -

MATRIX SPIKE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802166-01 **Client ID:** RAWTP-07 2"-1'MS

Percent Solids for Sample: 100.00 **Spiked ID:** W820288-MS1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	137.4510		32.1565		1000	105		P
Copper	mg/Kg	75 - 125	1145.6530		984.0973		1000	162		P
Lead	mg/Kg	75 - 125	121.2453		26.0562		1000	95		P

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802166-01 **Client ID:** RAWTP-07 2"-1'MSD

Percent Solids for Sample: 100.00 **Spiked ID:** W820288-MSD1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	130.6059		32.1565		1000	98		P
Copper	mg/Kg	75 - 125	1107.4110		984.0973		1000	123		P
Lead	mg/Kg	75 - 125	115.5948		26.0562		1000	90		P

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W820288-MS1 **Client ID:** RAWTP-07 2"-1'MSD

Percent Solids for Sample: 100.00 **Duplicate ID:** W820288-MSD1 **Percent Solids for Duplicate:** 100.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	mg/Kg		137.4510		130.6059		5		P
Copper	mg/Kg		1145.6530		1107.4110		3		P
Lead	mg/Kg		121.2453		115.5948		5		P

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSS			**LCS Source:**	**QC19115SCSN**			**Batch Number:**	**EPA 3050B-**
	Arsenic	mg/Kg	100	97.7		98	80.0 - 120.0	P
	Copper	mg/Kg	100	96.0		96	80.0 - 120.0	P
	Lead	mg/Kg	100	97.2		97	80.0 - 120.0	P

- 10 -
METHOD DETECTION LIMITS

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Analyte	Wave- length (nm)	MDL	PQL
OPTIMA5		**Date:** 2/11/2008	
OPT5 GOLDER			
Arsenic Soil	188.979	7.1	25
Copper Soil	324.752	2.9	10
Lead Soil	220.353	2.3	7.5
Arsenic Water	188.979	8.8	25
Copper Water	324.752	5.8	10
Lead Water	220.353	2.7	7.5
OPTIMA7		**Date:** 3/20/2008	
OPT7 GOLDER			
Arsenic Soil	188.979	7.1	25
Copper Soil	324.752	2.9	10
Lead Soil	220.353	2.3	7.5
Arsenic Water	188.979	8.8	25
Copper Water	324.752	5.8	10
Lead Water	220.353	2.7	7.5

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA5 **Date:** 4/4/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	Ag
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	-0.0437999	0.0000000	0.0408321	0.0000000	0.0000000
Arsenic	188.98	-0.0051872	0.0000000	0.0000000	0.0053922	0.8023340
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	-0.0041094	0.0000000	0.1902620	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0184321	0.0118780	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0567697	0.0000000
Lead	220.35	-0.0785731	-0.0077438	0.0166316	0.0074316	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0558488	0.0257812	0.0000000
Nickel	232.00	0.0000000	0.0000000	-0.9836570	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	-0.0202395	0.0000000	-0.0972076	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0463997	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	-0.0530207	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0712195	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0313481	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA5 **Date:** 4/4/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: As	Ba	Be	Cd	Co
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	-1.8695500
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.1866050	0.0000000	0.0000000	-0.3650900
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.2612720	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	-0.4265570
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.5709890
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.7065560	0.0000000	1.4516000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	1.1105900
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA5 **Date:** 4/4/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Cr	Cu	Mn	Mo	Na
Aluminum	308.22	0.0000000	0.0000000	0.0000000	17.4125004	0.0000000
Antimony	206.84	9.4869299	0.0000000	0.0000000	-4.7805800	0.0000000
Arsenic	188.98	1.0163400	0.0000000	0.0000000	2.2904899	0.0065611
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	-0.0745369	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	-0.0847830	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0611494	0.0000000	-0.1615550	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.2502760	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.6885690	0.1640430	-1.4733599	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	33.1503983	-0.4727670	-2.2425399	3.9440100	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.8720790	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.1483010	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.3013240	0.0000000	-2.4701900	0.0000000	0.0000000
Vanadium	292.40	-2.0251999	0.0000000	0.0000000	-7.7170501	0.0000000
Zinc	206.20	0.0000000	0.6035490	0.3771380	0.8993580	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA5 **Date:** 4/4/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Ni	Pb	Sb	Si	Ti
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	2.5661600
Antimony	206.84	-0.9826560	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0308934	0.0000000	0.0000000	-2.5350699
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0485710
Cadmium	226.50	-0.6658500	0.0000000	0.0000000	0.0000000	0.2439670
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	2.3056700
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	-0.4633660
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	-1.1737000
Lead	220.35	-0.3088640	0.0000000	-0.0880853	-0.1309840	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.4578570
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.6209380
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA5 **Date:** 4/4/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Tl	V			
Aluminum	308.22	0.0000000	14.3895998			
Antimony	206.84	0.6631970	-0.6592910			
Arsenic	188.98	0.0000000	0.2876220			
Barium	233.53	0.0000000	0.0000000			
Beryllium	313.11	0.0000000	0.0000000			
Cadmium	226.50	0.0000000	0.0000000			
Calcium	315.89	0.0000000	0.0000000			
Chromium	267.72	0.0000000	0.1499040			
Cobalt	228.62	0.0000000	0.0000000			
Copper	324.75	0.0000000	0.0000000			
Iron	273.96	0.0000000	3.3234301			
Lead	220.35	0.0000000	0.0000000			
Magnesium	279.08	0.0000000	0.0000000			
Manganese	260.57	0.0000000	0.0000000			
Nickel	232.00	0.0000000	0.0000000			
Potassium	766.49	0.0000000	0.0000000			
Selenium	196.03	0.0000000	0.0000000			
Silver	328.07	0.0000000	-0.1136500			
Sodium	589.59	0.0000000	0.0000000			
Thallium	190.80	0.0000000	0.8801670			
Vanadium	292.40	0.0000000	0.0000000			
Zinc	206.20	0.0000000	0.0000000			

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	Ag
Aluminum	308.22	0.0000000	0.0207190	0.0120300	-0.0515205	-4.9158802
Antimony	206.84	-0.0267947	-0.0235140	-0.0652917	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0026736	0.0617380	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0064810	-0.0021755	0.1105640	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0086530	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0128574	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0136640	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0719449	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.3618530	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0463195	0.0339874	0.0000000
Nickel	232.00	-0.0108972	-0.0086700	-0.2357930	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0671620	0.0000000	-0.0735814	0.0000000	0.0000000
Silver	328.07	0.0080000	0.0026432	-0.0431800	-0.0009512	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0159040	-0.0255790	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0196000	0.0000000	0.0000000
Zinc	206.20	0.0147479	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: As	B	Be	Cd	Co
Aluminum	308.22	-0.7712260	0.0000000	1.9230000	0.0000000	-8.4645996
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	-0.0452534
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0061070	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	-0.3502000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	2.2788999
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.6054300
Nickel	232.00	0.0000000	0.0000000	-0.4082000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	-0.0666463	0.0000000	0.0000000	-0.0206171
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	4.5946798
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.2605720	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Cr	Cu	Li	Mn	Mo
Aluminum	308.22	0.0000000	0.5861200	0.2252000	0.5555770	20.0904007
Antimony	206.84	5.5828600	0.0000000	0.0000000	0.0000000	-3.6831999
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	-0.1127460	0.0000000	0.0000000	0.0218515	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0613697
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	1.5008000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	-1.6574301
Cobalt	228.62	-0.1267530	0.0000000	0.0000000	0.0706386	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.5458750
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	-2.2182000	0.3641500	0.0000000	0.0915702	-0.2396000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	-1.5451100	0.0000000
Manganese	260.57	-0.1219760	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	13.8179998	-0.3078670	0.0000000	0.2056650	3.0824201
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	1.2911400	0.0000000
Silver	328.07	0.0000000	0.0327636	-0.0306730	0.1590960	0.0713769
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.3364670	0.0000000	0.0000000	-1.7416400	-0.5289330
Vanadium	292.40	-4.4160600	-0.0520540	0.0000000	-0.1773900	-0.4541660
Zinc	206.20	-1.5611300	0.0000000	0.0000000	0.3653180	0.8787460

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Na	Ni	Pb	Sb	Se
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0476335	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0648597	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.1080310	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.1204100	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	-0.2269880	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0048533	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.6535250	0.3507140

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Si	Sn	Sr	Ti	Tl
Aluminum	308.22	0.0000000	0.0000000	-3.8224199	2.0929599	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.5032240	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.1360430	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.1393840	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	2.0177901	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	-0.7596230	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	-0.0080177	-0.0100551	-0.0782215	0.0000000	-0.0094611
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	-1.9865000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.7094510	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.2964610

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: U	V	Zn	La	
Aluminum	308.22	-8.4760399	-10.4483004	-0.3308580	0.1640000	
Antimony	206.84	-1.1049000	0.0000000	0.0000000	0.0000000	
Arsenic	188.98	0.0000000	0.0000000	0.0000000	55.5082016	
Barium	233.53	-0.0388368	0.1318340	0.0000000	0.0000000	
Beryllium	313.11	-0.0741906	0.0000000	0.0000000	0.0000000	
Cadmium	226.50	-0.0501594	0.0000000	0.0000000	-0.1327000	
Calcium	315.89	2.6055901	-3.5826399	0.0000000	0.0000000	
Chromium	267.72	-1.0719800	0.1526560	0.0000000	0.0000000	
Cobalt	228.62	0.1274260	0.0000000	0.0000000	0.0000000	
Copper	324.75	0.5231330	-0.2011560	0.0000000	0.0000000	
Iron	273.96	-1.1845200	4.1059599	0.0000000	0.0000000	
Lead	220.35	1.2635400	0.0000000	0.0000000	0.4454000	
Magnesium	279.08	-12.8909998	0.0000000	0.0000000	0.0000000	
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	
Nickel	232.00	0.0000000	0.0000000	0.1456010	-20.4916000	
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	
Selenium	196.03	0.0000000	0.0000000	0.0000000	-4.0792599	
Silver	328.07	0.7184970	-0.1259390	0.0000000	-0.0451447	
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	
Thallium	190.80	0.0000000	2.5700600	0.0000000	0.0000000	
Vanadium	292.40	-1.5207601	0.0000000	0.0000000	0.9598270	
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA5 **Date:** 4/6/2008

Analyte	Integration Time (sec)	LDR ug/L	
Arsenic	20.00	50000	OPT5 GOLDER
Copper	20.00	30000	OPT5 GOLDER
Lead	20.00	100000	OPT5 GOLDER

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 3/19/2008

Analyte	Integration Time (sec)	LDR ug/L	
Arsenic	20.00	50000	OPT7 GOLDER
Copper	20.00	90000	OPT7 GOLDER
Lead	20.00	100000	OPT7 GOLDER

- 13 -
SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802166

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number: EPA 3050B-05202008 **Method:** P							
PBS	PBS	MB	SOIL	5/20/08	1.00	100.0	100.00
LCSS	LCSS	LCS	SOIL	5/20/08	1.00	100.0	100.00
W802166-01	RAWTP-07 2"-1'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W820288-MS1	RAWTP-07 2"-1'MS	MS	SOIL	5/20/08	1.00	100.0	100.00
W820288-MSD1	RAWTP-07 2"-1'MSD	MSD	SOIL	5/20/08	1.00	100.0	100.00
W802166-02	RAWTP-07 1'-2'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-03	RAWTP-07 2'-3'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-04	BFD-05	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-05	RAWTP-08 2"-1'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-06	RAWTP-08 1'-2'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-07	RAWTP-08 2'-3'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-08	RAWTP-08 3'-4'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-09	RAWTP-09 2"-1'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-10	RAWTP-09 1'-2'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-11	RAWTP-09 2'-3'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-12	RAWTP-09 3'-4'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-13	RAWTP-10 2"-1'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-14	RAWTP-10 1'-2'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-15	RAWTP-10 2'-3'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-16	RAWTP-12 2"-1'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-17	RAWTP-12 1'-2'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-18	RAWTP-12 2'-3'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-19	RAWTP-12 3'-4'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802166-20	BFD-08	SAM	SOIL	5/20/08	1.00	100.0	100.00

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802166

Instrument ID Number: OPTIMA7 Method: P Run Number: W820288

Start Date: 5/22/2008 End Date: 5/22/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN			
CALIB BLANK 1	1.00	0649				X							X		X															
STD1	1.00	0655				X							X		X															
STD2	1.00	0700																												
STD3	1.00	0705																												
STD4	1.00	0709																												
STD5	1.00	0713																												
ICV	1.00	0718				X							X		X															
ICV	1.00	0725				X							X		X															
ICB	1.00	0730				X							X		X															
CRI	1.00	0735				X							X		X															
ICSA	1.00	0741				X							X		X															
ICSAB	1.00	0746				X							X		X															
CCV	1.00	0752				X							X		X															
CCB	1.00	0757				X							X		X															
PBS	1.00	0825				X							X		X															
LCSS	1.00	0830				X							X		X															
RAWTP-07 2"-1'	1.00	0836				X							X		X															
RAWTP-07 2"-1'MS	1.00	0842				X							X		X															
ZZZZZZ	1.00	0847																												
RAWTP-07 2"-1'MSD	1.00	0853				X							X		X															
RAWTP-07 1'-2'	1.00	0859				X							X		X															
RAWTP-07 2'-3'	1.00	0904				X							X		X															
BFD-05	1.00	0910				X							X		X															
RAWTP-08 2"-1'	1.00	0916				X							X		X															
CCV	1.00	0921				X							X		X															
CCB	1.00	0927				X							X		X															
RAWTP-08 1'-2'	1.00	0932				X							X		X															
RAWTP-08 2'-3'	1.00	0938				X							X		X															
RAWTP-08 3'-4'	1.00	0943				X							X		X															
RAWTP-09 2"-1'	50.00	0949				X							X		X															
RAWTP-09 1'-2'	1.00	0955				X							X		X															
RAWTP-09 2'-3'	1.00	1000				X							X		X															
RAWTP-09 3'-4'	1.00	1006				X							X		X															
RAWTP-10 2"-1'	50.00	1011				X							X		X															
RAWTP-10 1'-2'	1.00	1017				X							X		X															
RAWTP-10 2'-3'	50.00	1022				X							X		X															

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802166

Instrument ID Number: OPTIMA7 Method: P Run Number: W820288

Start Date: 5/22/2008 End Date: 5/22/2008

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CCV	1.00	1027				X							X		X												
CCB	1.00	1032				X							X		X												

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802166

Instrument ID Number: OPTIMA5 Method: P Run Number: W820288A

Start Date: 5/23/2008 End Date: 5/23/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CALIB BLANK 1	1.00	0801				X							X		X												
STD1	1.00	0807				X							X		X												
STD2	1.00	0813																									
STD3	1.00	0817																									
STD4	1.00	0822																									
STD5	1.00	0826																									
ICV	1.00	0830				X							X		X												
ICV	1.00	0835				X							X		X												
ICB	1.00	0842				X							X		X												
CRI	1.00	0847				X							X		X												
ICSA	1.00	0853				X							X		X												
ICSAB	1.00	0859				X							X		X												
CCV	1.00	0905				X							X		X												
CCB	1.00	0912				X							X		X												
RAWTP-12 2"-1'	50.00	0930				X							X		X												
RAWTP-12 1'-2'	1.00	0935				X							X		X												
RAWTP-12 2'-3'	1.00	0942				X							X		X												
RAWTP-12 3'-4'	1.00	0949				X							X		X												
BFD-08	1.00	0955				X							X		X												
CCV	1.00	1002				X							X		X												
CCB	1.00	1008				X							X		X												

Innovative Technical Solutions, Inc.
A Gilbane Company

October 07, 2011

Dr. Casey McKeon
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

RE: ITSI DATA VALIDATION REPORT
RESOLUTION COPPER MINING
HUMAN HEALTH RISK ASSESSMENT
SDG W802166

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) has completed the data review for Resolution Copper Mining (RCM) for its Human Health Risk Assessment (HHRA) soil samples collected in 2008. ITSI performed data review as described in the U.S. Environmental Protection Agency's (EPA) *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004; and the *Sampling and Analysis Plan (SAP) for Clean Closure at Resolution Copper Mining Limited (Resolution), West Plant Site, Superior Mine* , (Golder, June 2005).

The acronym and abbreviations list is included as Appendix A. Data review qualifiers have been marked in red directly on the analytical reports provided by the laboratory and are attached as Appendix B. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C. A summary of the field duplicate pair results is provided in the Field Duplicate Table as Appendix D. Client communications are provided as Appendix E. The ITSI standard legal notice is provided as Appendix F.

1.0 CROSS REFERENCE OF SAMPLES VERIFIED

The analytical data presented in the laboratory Sample Delivery Group (SDG) listed in Table 1 underwent an EPA Level III data validation. The Level III data validation is equivalent to a Step 2A validation, manual (S2AVM) as defined in the *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009). The SDGs contained data for arsenic, copper and lead by EPA Method 6010B.

1501 West Fountainhead Parkway, Suite 350
Tempe, Arizona 85282

(480) 706-6488
fax (480) 704-2952
www.itsi.com

The primary analytical laboratory was SVL of Kellogg, Idaho. Table 1 below provides an analytical summary and cross reference for the samples.

Table 1 Analytical Summary and Cross Reference for Method 6010B

Client Sample ID	Laboratory SDG Number	Date Sampled	Type
RAWTP-07 2"-1'	W802166-01	5/01/2008	MS/MSD
RAWTP-07 1'-2'	W802166-02	5/01/2008	
RAWTP-07 2'-3'	W802166-03	5/01/2008	PS 1
BFD-05	W802166-04	5/01/2008	FD 1
RAWTP-08 2"-1'	W802166-05	4/30/2008	
RAWTP-08 1'-2'	W802166-06	4/30/2008	
RAWTP-08 2'-3'	W802166-07	4/30/2008	
RAWTP-08 3'-4'	W802166-08	4/30/2008	
RAWTP-09 2"-1'	W802166-09	4/30/2008	
RAWTP-09 1'-2'	W802166-10	4/30/2008	
RAWTP-09 2'-3'	W802166-11	4/30/2008	
RAWTP-09 3'-4'	W802166-12	4/30/2008	
RAWTP-10 2"-1'	W802166-13	4/30/2008	
RAWTP-10 1'-2'	W802166-14	4/30/2008	
RAWTP-10 2'-3'	W802166-15	4/30/2008	
RAWTP-12 2"-1'	W802166-16	4/28/2008	
RAWTP-12 1'-2'	W802166-17	4/28/2008	
RAWTP-12 2'-3'	W802166-18	4/28/2008	PS 2
RAWTP-12 3'-4'	W802166-19	4/28/2008	
BFD-08	W802166-20	4/28/2008	FD 2
DRB-TP07	*	5/1/2008	RB

*Rinse blank samples are reported in SDG W802216.
FD = Field duplicate sample
MS/MSD = Matrix spike/matrix spike duplicate
PS = Parent sample of field duplicate
RB = Rinse blank

The EPA S2AVM data validation included review of the report from the laboratory equivalent to an abbreviated EPA Level III data deliverable with standardized EPA forms. Level III data deliverables contain the sample results and chain-of-custody forms along with basic Quality Control (QC) summaries including surrogate recoveries, method blank results, and precision and accuracy data summaries for the sample preparation batch. As discussed in Section 2.0 below, the laboratory did not include any comments in the case narrative addressing any QC problems.

2.0 LABORATORY REPORT

The data were reported by the laboratory as an EPA Level III deliverable with standardized EPA forms. The data qualifiers noted by the laboratory in the report were reviewed. Anomalies that required data qualification, if any, are discussed in the sections below. Since the laboratory did not include a case narrative in the report, only the quality control anomalies from the Level III data deliverable could be addressed. Also, there was no official laboratory signature authorizing the release of the report or issue date. ITSI advises that all laboratory reports received by the client contain an official signature authorizing the release of the report and that the issue date should be documented on the report. In addition, the laboratory should provide an officially signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

3.0 SAMPLE INTEGRITY

The Chains-of-Custody (COC) for the April 28 through May 01, 2008 sampling event were available for review. The rinse blank sample listed on the COC is logged in under SDG S802166 with the other rinse blanks. There were no anomalies that required qualification of the data, however, the following COC anomaly was observed.

- The transfer of the samples to the shipping carrier was not documented on the COC. The client indicated that the samplers shipped the samples to SVL via FedEx. ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number. A copy of the communication with the client verifying the transfer of samples to FedEx is provided in Appendix E.

- A couple of corrections were not dated or initialed on the COC. ITSI recommends that all corrections to the COC be made with a single line strike-out with the date, time and initials of responsible person documented on the COC.

4.0 HOLDING TIME

The samples were analyzed within the recommended method holding time of 180 days after collection.

5.0 INITIAL AND CONTINUING CALIBRATION

The initial and continuing calibrations were not reviewed for this level of validation.

6.0 BLANK EVALUATION

Preparation and equipment blanks were reviewed. The equipment blank(s) associated with the samples are listed in the Data Validation Report (DVR) for SDG W802216. There were no compounds detected in any of the blanks that required qualification of the data.

7.0 LABORATORY CONTROL SAMPLE

A laboratory control sample (LCS) was reported for each analysis. QC results were reviewed using the control limits listed in Table C6 of the SAP. There were no LCS anomalies that required qualification of the data.

8.0 MATRIX SPIKE AND MATRIX SPIKE DUPLICATE

The project matrix spike/matrix spike duplicate (MS/MSD) pair was reviewed using the laboratory control limits of 75 to 125 percent for accuracy and 20 relative percent difference (RPD) for precision. The sample used as the MS/MSD pair is identified in Table 1. There were no MS/MSD anomalies that required qualification of the data except as noted below.

- The percent recovery for copper was out of the upper laboratory control limit of 125 percent at 162 percent. Since the LCS percent recovery was acceptable, only the result in the sample spiked, RAWTP-07 2"-1', has been flagged “J+” for an estimated value with a high bias.

9.0 REPORTING LIMIT SPIKES

Spikes prepared at the laboratory’s reporting limit were reviewed. There were no reporting limit spike anomalies that required qualification of the data.

10.0 COMPOUND QUANTITATION AND IDENTIFICATION

The laboratory reporting limits and quantitative results were reviewed. All reporting limits met the Client Required Detection Limits (CRDLs) listed in the SAP. There were no quantitative anomalies that required qualification of the data, however, the following observation was made.

- There were no units listed on reporting Form 10 for the instrument method detection limits (MDLs) and practical quantitation limits (PQLs) provided with the data package. To provide traceability of laboratory reporting limits from the

instrument to the reported data, the laboratory is advised to list the MDL and PQL units on all reporting forms.

11.0 FIELD DUPLICATE SAMPLES

Field duplicate sets were collected and analyzed to measure field and laboratory precision. The results of the field duplicate and parent samples were compared and are summarized in the Field Duplicate Table presented as Appendix D. All field duplicate results were acceptable except as noted below.

- The relative percent differences (RPDs) for copper in field duplicate set RAWTP-07 2'-3' / BFD-05 and arsenic and copper in field duplicate set RAWTP-12 2'-3' / BFD-08 were out of the control limit of 35. The associated results in the duplicate sets have been qualified as "J" for an estimated value.

12.0 RECOMMENDATIONS

ITSI recommends the following actions.

- ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number.

- ITSI recommends that all corrections to the COC be made with a single line strike-out with the date, time and initials of responsible person documented on the COC.

- ITSI advises that all laboratory reports must contain an official signature authorizing the release of the report and that the issue date be documented on the report. Also, the laboratory should provide a properly signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

- ITSI advises the laboratory to list the MDL and PQL units on all reporting forms to provide traceability of laboratory reporting limits from the instrument to the reported data.

13.0 OVERALL ASSESSMENT FOR RCM HHRA APRIL 28 THROUGH MAY 01, 2008 SAMPLING EVENT

There were no rejected results for this sampling event. Based on the available information, the data as qualified are considered useable for their intended purposes. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C.

We thank you for the opportunity to serve you and look forward to supporting RCM with data review in the future.

Sincerely,

Innovative Technical Solutions, Inc.

Evelyn Dawson, CHMM

Program Chemist

Enclosures:

Appendix A – List of Acronyms and Abbreviations
Appendix B – Qualified Report Pages
Appendix C – Qualified Results Table
Appendix D – Field Duplicate Table
Appendix E – Client Communication
Appendix F – ITSI Standard Legal Notice

cc: John Malusa
Golder Associates, Inc.
4730 North Oracle Road, Suite 210
Tucson, Arizona, 85705

APPENDIX A

LIST OF ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS AND ABBREVIATIONS

COC	chain-of-custody
CRDL	Client Required Detection Limits
EPA	U.S. Environmental Protection Agency
FD	field duplicate
HHRA	Human Health Risk Assessment
ITSI	Innovative Technical Solutions, Inc.
LCS	laboratory control spike
MDL	method detection limits
MS/MSD	matrix spike/matrix spike duplicate
PQL	practical quantitation limit
PS	parent sample
QC	quality control
QRT	Qualified Results Table
RPD	relative percent difference
RCM	Resolution Copper Mining
SAP	Sample Analysis Plan
S2AVM	Step 2A validation, manual
SDG	Sample Delivery Group

APPENDIX B

QUALIFIED REPORT PAGES

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-01 **Client ID:** RAWTP-07 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	32.2	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	984	mg/Kg		J+	P	0.29	OPTIMA7	W820288
7439-92-1	Lead	26.1	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

PGC ITSI
30Sep2011

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-03 **Client ID:** RAWTP-07 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	11.3	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	57.3 J	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	7.4	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

PGC ITSI

30Sep2011

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-04 **Client ID:** BFD-05

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	7.6	mg/Kg			P	0.71	OPTIMA7	W820288
7440-50-8	Copper	37.1 J	mg/Kg			P	0.29	OPTIMA7	W820288
7439-92-1	Lead	7.4	mg/Kg			P	0.23	OPTIMA7	W820288

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

PGC ITSI
30Sep2011

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-18 **Client ID:** RAWTP-12 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	21.7 J	mg/Kg			P	0.71	OPTIMA5	W820288A
7440-50-8	Copper	247 J	mg/Kg			P	0.29	OPTIMA5	W820288A
7439-92-1	Lead	14.1	mg/Kg			P	0.23	OPTIMA5	W820288A

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

PGC ITSI
30Sep2011

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802166 **Method Type:**

Sample ID: W802166-20 **Client ID:** BFD-08

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration		Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	9.7	J	mg/Kg			P	0.71	OPTIMA5	W820288A
7440-50-8	Copper	108	J	mg/Kg			P	0.29	OPTIMA5	W820288A
7439-92-1	Lead	10.4		mg/Kg			P	0.23	OPTIMA5	W820288A

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

PGC ITSI
30Sep2011

APPENDIX C

QUALIFIED RESULTS TABLE

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Parameter	Original Value	Added Qualifier	New Value	PQL	MDL	Units	Reason	Validator
W802166-03	RAWTP-07 2'-3'	05/01/08	Soil	EPA 6010B	Copper	57.3	J	57.3 J	1	0.29	mg/kg	RPD FD	PGC/EHD
W802166-04	BFD-05	05/01/08	Soil	EPA 6010B	Copper	37.1	J	37.1 J	1	0.29	mg/kg	RPD FD	PGC/EHD
W802166-18	RAWTP-12 2'-3'	04/28/08	Soil	EPA 6010B	Arsenic	21.7	J	21.7 J	2.5	0.71	mg/kg	RPD FD	PGC/EHD
W802166-18	RAWTP-12 2'-3'	04/28/08	Soil	EPA 6010B	Copper	247	J	247 J	1	0.29	mg/kg	RPD FD	PGC/EHD
W802166-20	BFD-08	04/28/08	Soil	EPA 6010B	Arsenic	9.7	J	9.7 J	2.5	0.71	mg/kg	RPD FD	PGC/EHD
W802166-20	BFD-08	04/28/08	Soil	EPA 6010B	Copper	108	J	108 J	1	0.29	mg/kg	RPD FD	PGC/EHD
W802166-01	RAWTP-07 2"-1'	05/01/08	Soil	EPA 6010B	Copper	984	J +	984 J+	1	0.29	mg/kg	%R MS	PGC/EHD

Notes

J = estimated value
J+ = estimated value with high bias
mg/kg = milligrams per kilogram

FD = field duplicate
MDL = method detection limit
MS = matrix spike
PQL = Practical Quantitation Limit
%R = percent recovery
RPD = relative percent difference

APPENDIX D

FIELD DUPLICATE TABLE

Field Duplicate Results
Resolution Copper Mining
Human Health Risk Assessment

Client ID Primary/FD	Laboratory ID Primary/FD	Metal	Sample mg/kg	Duplicate mg/kg	RPD	Agreement (Yes) Non-agreement (No)
RAWTP-07 2'-3' / BFD-05	W802166-03 / 04	Arsenic	11.3	7.6	39%	Yes
RAWTP-07 2'-3' / BFD-05	W802166-03 / 04	Copper	57.3	37.1	43%	No
RAWTP-07 2'-3' / BFD-05	W802166-03 / 04	Lead	7.4	7.4	0%	Yes
RAWTP-12 2'-3' / BFD-08	W802166-18 / 20	Arsenic	21.7	9.7	76%	No
RAWTP-12 2'-3' / BFD-08	W802166-18 / 20	Copper	247	108	78%	No
RAWTP-12 2'-3' / BFD-08	W802166-18 / 20	Lead	14.1	10.4	30%	Yes

Notes
mg/kg = milligrams per kilogram
FD = field duplicate
No = RPD greater than control limit of 35
Yes = RPD less than control limit of 35 or both results less than five times the reporting limit
RPD = relative percent difference

APPENDIX E

CLIENT COMMUNICATION

Peggy Cota

From: Morfin, Orestes <Orestes_Morfin@golder.com>
Sent: Tuesday, September 27, 2011 1:52 PM
To: Peggy Cota; Evelyn Dawson
Cc: Malusa, John
Subject: 2008 RAWTP sample shipping

Hello Peggy and Evelyn,
I received an e-mail today from Alejandra Bonilla, one of the two field crew who collected the 2008 RAWTP samples. She confirmed that the samples were shipped to SVL via FedEx.
I hope that helps.
Sincerely,
Orestes

Orestes Morfín (M.Sc.)| Project Hydrogeochemist | **Golder Associates Ltd.**
102, 2535 - 3rd Avenue S.E., Calgary, Alberta, Canada T2A 7W5
T: +1 (403) 299 5600 | **D:** +1 403 513-3574 | **F:** +1 (403) 299-5606 | **C:** +1 | **E:** Orestes_Morfin@golder.com | **www.golder.com**

Work Safe, Home Safe

APPENDIX F

ITSI STANDARD LEGAL NOTICE

ITSI STANDARD LEGAL NOTICE

ITSI is issuing this report at the request of the Client and based upon information furnished by Client. Further, the presence of environmental contamination can be influenced by many factors, including unknown and changing underground conditions. Therefore: 1. This report may not be relied upon by anyone for financial decision-making. 2. No one other than Client is authorized to use this report for any purpose. 3. Any conclusions or opinions included in this report are subject to reasonable revision based upon any new environmental or other data which is later developed. 4. Any results or conclusions stated are to be considered limited by the quality of the underlying sample or other data on which they are based, the budget established by the Client or otherwise for gathering and analyzing data, and by any assumptions and qualifications contained within this report.

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802167 **Method Type:** **SOW No.:** SW-846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802167-01	RAWTP-14 2"-1'	
W802167-02	RAWTP-14 1'-2'	
W802167-03	RAWTP-14 2'-3'	
W802167-04	RAWTP-15 2"-1'	
W802167-05	RAWTP-15 1'-2'	
W802167-06	RAWTP-15 2'-3'	
W802167-07	BFD-3	
W802167-08	RAWTP-16 2"-1'	
W802167-09	RAWTP-16 1'-2'	
W802167-10	RAWTP-16 2'-3'	
W802167-11	RAWTP-16 3'-4'	
W802167-12	RAWTP-18 2"-1'	
W802167-13	RAWTP-18 1'-2'	
W802167-14	RAWTP-18 2'-3'	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802167 **Method Type:** **SOW No.:** SW-846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802167-15	RAWTP-18 3'-4'	
W802167-16	RAWTP-19 2"-6"	
W802167-17	RAWTP-02 2"-1'	
W802167-18	RAWTP-02 1'-2'	
W802167-19	RAWTP-02 2'-3'	
W802167-20	RAWTP-02 3'-4'	
W820289-MS1	RAWTP-14 2"-1'MS	Matrix Spike
W820289-MSD1	RAWTP-14 2"-1'MSD	Matrix Spike Duplicate

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-07 **Client ID:** BFD-3

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	140	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	874	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	57.7	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-18 **Client ID:** RAWTP-02 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	24.3	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	45.9	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	9.3	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-17 **Client ID:** RAWTP-02 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	23.1	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	199	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	13.3	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-19 **Client ID:** RAWTP-02 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	15.0	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	32.1	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	7.9	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-20 **Client ID:** RAWTP-02 3'-4'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	19.7	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	32.1	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	7.9	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-02 **Client ID:** RAWTP-14 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	429	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	4320	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	142	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-01 **Client ID:** RAWTP-14 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	2090	mg/Kg		D	P	7.1	OPTIMA6	W820289
7440-50-8	Copper	10700	mg/Kg		D	P	2.9	OPTIMA7	W820289A
7439-92-1	Lead	912	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-03 **Client ID:** RAWTP-14 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	178	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	1490	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	78.0	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-05 **Client ID:** RAWTP-15 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	297	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	1960	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	113	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-04 **Client ID:** RAWTP-15 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	584	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	2920	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	230	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-06 **Client ID:** RAWTP-15 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	59.7	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	404	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	30.3	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-09 **Client ID:** RAWTP-16 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	18.0	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	254	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	12.3	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-08 **Client ID:** RAWTP-16 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	127	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	2030	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	43.3	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-10 **Client ID:** RAWTP-16 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	6.6	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	122	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	11.2	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-11 **Client ID:** RAWTP-16 3'-4'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	5.4	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	54.2	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	9.5	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-13 **Client ID:** RAWTP-18 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	111	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	2640	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	49.0	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-12 **Client ID:** RAWTP-18 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	638	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	13700	mg/Kg		D	P	2.9	OPTIMA7	W820289A
7439-92-1	Lead	262	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-14 **Client ID:** RAWTP-18 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	19.9	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	312	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	15.5	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-15 **Client ID:** RAWTP-18 3'-4'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	76.0	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	1710	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	37.6	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-16 **Client ID:** RAWTP-19 2"-6"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	17.1	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	341	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	21.5	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802167
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV					**Source:** 08E0067				
	Arsenic	2024.78	2000.0	101	90.0 - 110.0	P	5/21/2008	09:26	W820289
	Lead	2028.40	2000.0	101	90.0 - 110.0	P	5/21/2008	09:26	W820289
ICV					**Source:** 08E0067				
	Arsenic	2014.43	2000.0	101	90.0 - 110.0	P	5/21/2008	09:31	W820289
	Lead	2020.74	2000.0	101	90.0 - 110.0	P	5/21/2008	09:31	W820289
CCV					**Source:** 08E0067				
	Arsenic	2010.60	2000.0	101	90.0 - 110.0	P	5/21/2008	10:00	W820289
	Lead	2022.41	2000.0	101	90.0 - 110.0	P	5/21/2008	10:00	W820289
CCV					**Source:** 08E0067				
	Arsenic	1988.03	2000.0	99	90.0 - 110.0	P	5/21/2008	11:08	W820289
	Lead	2009.74	2000.0	100	90.0 - 110.0	P	5/21/2008	11:08	W820289
CCV					**Source:** 08E0067				
	Arsenic	1997.57	2000.0	100	90.0 - 110.0	P	5/21/2008	12:38	W820289
	Lead	2016.51	2000.0	101	90.0 - 110.0	P	5/21/2008	12:38	W820289
CCV					**Source:** 08E0067				
	Arsenic	2018.98	2000.0	101	90.0 - 110.0	P	5/21/2008	13:30	W820289
	Lead	2027.56	2000.0	101	90.0 - 110.0	P	5/21/2008	13:30	W820289
ICV					**Source:** 08E0067				
	Copper	1971.44	2000.0	99	90.0 - 110.0	P	5/21/2008	14:52	W820289A
CCV					**Source:** 08E0067				
	Copper	1945.83	2000.0	97	90.0 - 110.0	P	5/21/2008	15:19	W820289A
CCV					**Source:** 08E0067				
	Copper	2026.09	2000.0	101	90.0 - 110.0	P	5/21/2008	16:25	W820289A
CCV					**Source:** 08E0067				
	Copper	1822.10	2000.0	91	90.0 - 110.0	P	5/21/2008	17:32	W820289A

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV					**Source:** 08E0067				
	Copper	1878.78	2000.0	94	90.0 - 110.0	P	5/21/2008	18:06	W820289A

- 2b -
CRDL STANDARD FOR AA & ICP

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Advisory Limits (%R)	M	Analysis Date	Analysis Time	Run Number
CRI					**Source:** 08E0089				
	Arsenic	29.02	25.0	116	50 - 150	P	5/21/2008	09:43	W820289
	Lead	7.23	7.5	96	50 - 150	P	5/21/2008	09:43	W820289
CRI					**Source:** 08E0089				
	Copper	6.37	10.0	64	50 - 150	P	5/21/2008	15:02	W820289A

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/21/2008	09:37	W820289
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/21/2008	09:37	W820289
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/21/2008	10:06	W820289
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/21/2008	10:06	W820289
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/21/2008	11:14	W820289
	Lead	-2.899	+/-7.500	J	2.700	7.500	P	5/21/2008	11:14	W820289
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/21/2008	11:34	W820289
	Lead	-3.416	+/-7.500	J	2.700	7.500	P	5/21/2008	11:34	W820289
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/21/2008	12:44	W820289
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/21/2008	12:44	W820289
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/21/2008	13:36	W820289
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/21/2008	13:36	W820289
ICB										
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/21/2008	14:57	W820289A
CCB										
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/21/2008	15:24	W820289A
CCB										
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/21/2008	16:30	W820289A

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/21/2008	17:37	W820289A
CCB	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/21/2008	18:11	W820289A

- 3b -
PREPARATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result (mg/Kg)	Conc Qual	Q	Acceptance Limit	MDL	PQL	M	Analysis Date	Analysis Time	Run
PBS			**SOIL**								
	Arsenic	0.710U			+/-0.710	0.710	2.500	P	5/21/2008	10:10	W820289
	Copper	0.290U			+/-0.290	0.290	1.000	P	5/21/2008	15:32	W820289A
	Lead	-0.353J			+/-0.230	0.230	0.750	P	5/21/2008	10:10	W820289

- 4 -

INTERFERENCE CHECK SAMPLE

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window	Analysis Date	Analysis Time	Run Number
ICSA					**Source:** 08E0109/08E0110			
	Arsenic	-0.14				5/21/2008	09:48	W820289
	Lead	-9.4				5/21/2008	09:48	W820289
ICSAB					**Source:** 08E0109/08E0110			
	Arsenic	492	500	98	80 - 120%	5/21/2008	09:54	W820289
	Lead	476	500	95	80 - 120%	5/21/2008	09:54	W820289
ICSA					**Source:** 08E0109/08E0110			
	Copper	10300	10000	103	80 - 120%	5/21/2008	15:08	W820289A
ICSAB					**Source:** 08E0109/08E0110			
	Copper	531	500	106	80 - 120%	5/21/2008	15:14	W820289A

- 5a -

MATRIX SPIKE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802167-01 **Client ID:** RAWTP-14 2"-1'MS

Percent Solids for Sample: 100.00 **Spiked ID:** W820289-MS1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	2151.7940		2085.5060		100.00	66		P
Copper	mg/Kg	75 - 125	11348.9200		10654.7300		100.00	694		P
Lead	mg/Kg	75 - 125	978.3850		912.2380		100.00	66		P

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802167-01 **Client ID:** RAWTP-14 2"-1'MSD

Percent Solids for Sample: 100.00 **Spiked ID:** W820289-MSD1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	1991.8760		2085.5060		100.00	-94		P
Copper	mg/Kg	75 - 125	10306.6500		10654.7300		100.00	-348		P
Lead	mg/Kg	75 - 125	964.5171		912.2380		100.00	52		P

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W820289-MS1 **Client ID:** RAWTP-14 2"-1'MSD

Percent Solids for Sample: 100.00 **Duplicate ID:** W820289-MSD1 **Percent Solids for Duplicate:** 100.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	mg/Kg		2151.7940		1991.8760		8		P
Copper	mg/Kg		11348.9200		10306.6500		10		P
Lead	mg/Kg		978.3850		964.5171		1		P

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSS			**LCS Source:**	**QC19115SCSN**			**Batch Number:**	**3050B-05202**
	Arsenic	mg/Kg	100.0	90.8		91	80.0 - 120.0	P
	Copper	mg/Kg	100.0	101.1		101	80.0 - 120.0	P
	Lead	mg/Kg	100.0	96.5		96	80.0 - 120.0	P

- 10 -
METHOD DETECTION LIMITS

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Analyte	Wave- length (nm)	MDL	PQL
OPTIMA6			**Date:** 8/3/2007
OPT6 GOLDER			
		ug/L	**ug/L**
Arsenic Water	188.979	8.8	25
Lead Water	220.353	2.7	7.5
		mg/Kg	**mg/Kg**
Arsenic Soil	188.979	7.1	25
Lead Soil	220.353	2.3	7.5
OPTIMA7			**Date:** 3/20/2008
OPT7 GOLDER			
		ug/L	**ug/L**
Copper Water	324.752	5.8	10
		mg/Kg	**mg/Kg**
Copper Soil	324.752	2.9	10

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	Ag
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	-0.0765672	-0.0644665	0.0000000	0.0000000	0.0000000
Arsenic	188.98	-0.0453300	0.0107280	-0.1694960	0.0096547	0.5484170
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.1752050	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	-0.0070810	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0135096	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.1028810	0.0000000
Lead	220.35	-0.1761670	-0.0093275	0.0759093	0.0136395	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0082748	0.0484627	0.0250031	0.0000000
Nickel	232.00	0.0000000	0.0000000	-0.3654500	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	-0.0788700	-0.3467340	-0.1369690	-0.0325080	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0615954	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0247628	0.0255788	-0.0191194	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0833371	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA6 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: As	B	Ba	Be	Cd
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.7718580	0.3662240	0.6959020	0.2240050
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.1476010
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	1.0277500	0.0000000	1.3923700	0.0000000
Silver	328.07	11.3802996	0.0000000	0.0940157	0.5006630	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Co	Cr	Cu	K	Mn
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	5.1155200	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.1364940	3.0330999	0.1387400	0.0167062	0.1403420
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	-0.1664470	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	-0.6262930
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	-1.9694901	0.0000000	0.0000000	0.0000000
Lead	220.35	0.1066280	-1.4665800	0.8985730	0.0071050	0.2005910
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.5061610	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	19.8810005	-0.3054260	0.0000000	-0.7663360
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.6312000	0.0000000	0.0000000	0.0217552	1.2965100
Silver	328.07	0.0000000	0.0000000	0.0841744	0.0000000	0.1365200
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	4.0985398	0.5022680	0.0000000	0.0000000	-4.5177302
Vanadium	292.40	0.0000000	-1.9750000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	1.1698000	0.5589550	0.0000000	0.3745840

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Mo	Na	Ni	Pb	Sb
Aluminum	308.22	8.8272104	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	-5.5751901	0.0000000	-0.7057950	0.0000000	0.0000000
Arsenic	188.98	5.8787198	0.0125257	0.0917551	0.0474070	0.2218660
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	-0.0933907	0.0000000	-0.5558650	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	-0.1877540	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.3159850	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	-1.6840400	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	-1.1172400	0.0000000	0.1911460	0.0000000	-0.1528630
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	2.3175099	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.4767700	0.0000000	0.0000000	0.1085480	0.5952360
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0707937	0.0000000
Vanadium	292.40	-8.4443502	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	1.1845100	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Si	Ti	Tl	V	Zn
Aluminum	308.22	0.0000000	1.8356500	0.0000000	17.3334999	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.6359800	-3.5668099	0.0000000
Arsenic	188.98	0.1542350	-0.4687320	0.1178850	0.4220050	0.1095200
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.1930730	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0563876	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.1992000	0.0000000
Cobalt	228.62	0.0000000	2.0478401	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	-0.7908210	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	3.2859499	0.0000000
Lead	220.35	-0.0611017	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.2394110	0.0000000	0.5458000	0.6221100	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	-0.1198070	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.4468930	0.0000000	2.6794500	0.0000000
Vanadium	292.40	0.0000000	0.6252580	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	Ag
Aluminum	308.22	0.0000000	0.0207190	0.0120300	-0.0515205	-4.9158802
Antimony	206.84	-0.0267947	-0.0235140	-0.0652917	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0026736	0.0617380	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0064810	-0.0021755	0.1105640	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0086530	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0128574	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0136640	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0719449	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.3618530	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0463195	0.0339874	0.0000000
Nickel	232.00	-0.0108972	-0.0086700	-0.2357930	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0671620	0.0000000	-0.0735814	0.0000000	0.0000000
Silver	328.07	0.0080000	0.0026432	-0.0431800	-0.0009512	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0159040	-0.0255790	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0196000	0.0000000	0.0000000
Zinc	206.20	0.0147479	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: As	B	Be	Cd	Co
Aluminum	308.22	-0.7712260	0.0000000	1.9230000	0.0000000	-8.4645996
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	-0.0452534
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0061070	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	-0.3502000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	2.2788999
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.6054300
Nickel	232.00	0.0000000	0.0000000	-0.4082000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	-0.0666463	0.0000000	0.0000000	-0.0206171
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	4.5946798
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.2605720	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Cr	Cu	Li	Mn	Mo
Aluminum	308.22	0.0000000	0.5861200	0.2252000	0.5555770	20.0904007
Antimony	206.84	5.5828600	0.0000000	0.0000000	0.0000000	-3.6831999
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	-0.1127460	0.0000000	0.0000000	0.0218515	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0613697
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	1.5008000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	-1.6574301
Cobalt	228.62	-0.1267530	0.0000000	0.0000000	0.0706386	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.5458750
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	-2.2182000	0.3641500	0.0000000	0.0915702	-0.2396000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	-1.5451100	0.0000000
Manganese	260.57	-0.1219760	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	13.8179998	-0.3078670	0.0000000	0.2056650	3.0824201
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	1.2911400	0.0000000
Silver	328.07	0.0000000	0.0327636	-0.0306730	0.1590960	0.0713769
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.3364670	0.0000000	0.0000000	-1.7416400	-0.5289330
Vanadium	292.40	-4.4160600	-0.0520540	0.0000000	-0.1773900	-0.4541660
Zinc	206.20	-1.5611300	0.0000000	0.0000000	0.3653180	0.8787460

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Na	Ni	Pb	Sb	Se
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0476335	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0648597	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.1080310	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.1204100	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	-0.2269880	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0048533	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.6535250	0.3507140

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Si	Sn	Sr	Ti	Tl
Aluminum	308.22	0.0000000	0.0000000	-3.8224199	2.0929599	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.5032240	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.1360430	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.1393840	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	2.0177901	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	-0.7596230	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	-0.0080177	-0.0100551	-0.0782215	0.0000000	-0.0094611
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	-1.9865000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.7094510	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.2964610

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: U	V	Zn	La	
Aluminum	308.22	-8.4760399	-10.4483004	-0.3308580	0.1640000	
Antimony	206.84	-1.1049000	0.0000000	0.0000000	0.0000000	
Arsenic	188.98	0.0000000	0.0000000	0.0000000	55.5082016	
Barium	233.53	-0.0388368	0.1318340	0.0000000	0.0000000	
Beryllium	313.11	-0.0741906	0.0000000	0.0000000	0.0000000	
Cadmium	226.50	-0.0501594	0.0000000	0.0000000	-0.1327000	
Calcium	315.89	2.6055901	-3.5826399	0.0000000	0.0000000	
Chromium	267.72	-1.0719800	0.1526560	0.0000000	0.0000000	
Cobalt	228.62	0.1274260	0.0000000	0.0000000	0.0000000	
Copper	324.75	0.5231330	-0.2011560	0.0000000	0.0000000	
Iron	273.96	-1.1845200	4.1059599	0.0000000	0.0000000	
Lead	220.35	1.2635400	0.0000000	0.0000000	0.4454000	
Magnesium	279.08	-12.8909998	0.0000000	0.0000000	0.0000000	
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	
Nickel	232.00	0.0000000	0.0000000	0.1456010	-20.4916000	
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	
Selenium	196.03	0.0000000	0.0000000	0.0000000	-4.0792599	
Silver	328.07	0.7184970	-0.1259390	0.0000000	-0.0451447	
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	
Thallium	190.80	0.0000000	2.5700600	0.0000000	0.0000000	
Vanadium	292.40	-1.5207601	0.0000000	0.0000000	0.9598270	
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6 **Date:** 4/8/2008

Analyte	Integration Time (sec)	LDR ug/L	
Arsenic	20.00	9000	OPT6 GOLDER
Lead	20.00	100000	OPT6 GOLDER

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA7 **Date:** 3/19/2008

Analyte	Integration Time (sec)	LDR ug/L	
Copper	20.00	90000	OPT7 GOLDER

- 13 -
SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802167

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number: 3050B-05202008	**Method:** P						
PBS	PBS	MB	SOIL	5/20/08	1.00	100.0	100.00
LCSS	LCSS	LCS	SOIL	5/20/08	1.00	100.0	100.00
W802167-01	RAWTP-14 2"-1'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W820289-MS1	RAWTP-14 2"-1'MS	MS	SOIL	5/20/08	1.00	100.0	100.00
W820289-MSD1	RAWTP-14 2"-1'MSD	MSD	SOIL	5/20/08	1.00	100.0	100.00
W802167-02	RAWTP-14 1'-2'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-03	RAWTP-14 2'-3'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-04	RAWTP-15 2"-1'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-05	RAWTP-15 1'-2'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-06	RAWTP-15 2'-3'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-07	BFD-3	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-08	RAWTP-16 2"-1'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-09	RAWTP-16 1'-2'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-10	RAWTP-16 2'-3'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-11	RAWTP-16 3'-4'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-12	RAWTP-18 2"-1'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-13	RAWTP-18 1'-2'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-14	RAWTP-18 2'-3'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-15	RAWTP-18 3'-4'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-16	RAWTP-19 2"-6"	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-17	RAWTP-02 2"-1'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-18	RAWTP-02 1'-2'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-19	RAWTP-02 2'-3'	SAM	SOIL	5/20/08	1.00	100.0	100.00
W802167-20	RAWTP-02 3'-4'	SAM	SOIL	5/20/08	1.00	100.0	100.00

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802167

Instrument ID Number: OPTIMA6 Method: P Run Number: W820289

Start Date: 5/21/2008 End Date: 5/21/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN			
CALIB BLANK 1	1.00	0858				X									X															
STD1	1.00	0904				X									X															
STD2	1.00	0909																												
STD3	1.00	0913																												
STD4	1.00	0917																												
STD5	1.00	0921																												
ICV	1.00	0926				X									X															
ICV	1.00	0931				X									X															
ICB	1.00	0937				X									X															
CRI	1.00	0943				X									X															
ICSA	1.00	0948				X									X															
ICSAB	1.00	0954				X									X															
CCV	1.00	1000				X									X															
CCB	1.00	1006				X									X															
PBS	1.00	1010				X									X															
LCSS	1.00	1016				X									X															
RAWTP-14 2"-1'	1.00	1021													X															
RAWTP-14 2"-1'MS	1.00	1028													X															
RAWTP-14 2"-1'MSD	1.00	1034													X															
RAWTP-14 2"-1'	10.00	1040				X																								
RAWTP-14 2"-1'MS	10.00	1045				X																								
RAWTP-14 2"-1'MSD	10.00	1051				X																								
RAWTP-14 1'-2'	1.00	1057				X									X															
RAWTP-14 2'-3'	1.00	1103				X									X															
CCV	1.00	1108				X									X															
CCB	1.00	1114				X									X															
CCB	1.00	1134				X									X															
RAWTP-15 2"-1'	1.00	1139				X									X															
RAWTP-15 1'-2'	1.00	1145				X									X															
RAWTP-15 2'-3'	1.00	1151				X									X															
BFD-3	1.00	1157				X									X															
RAWTP-16 2"-1'	1.00	1203				X									X															
RAWTP-16 1'-2'	1.00	1209				X									X															
RAWTP-16 2'-3'	1.00	1214				X									X															
RAWTP-16 3'-4'	1.00	1220				X									X															
RAWTP-18 2"-1'	1.00	1226				X									X															

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802167

Instrument ID Number: OPTIMA6 Method: P Run Number: W820289

Start Date: 5/21/2008 End Date: 5/21/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN				
RAWTP-18 1'-2'	1.00	1232				X									X															
CCV	1.00	1238				X									X															
CCB	1.00	1244				X									X															
RAWTP-18 2'-3'	1.00	1249				X									X															
RAWTP-18 3'-4'	1.00	1255				X									X															
RAWTP-19 2"-6"	1.00	1301				X									X															
RAWTP-02 2"-1'	1.00	1306				X									X															
RAWTP-02 1'-2'	1.00	1312				X									X															
RAWTP-02 2'-3'	1.00	1318				X									X															
RAWTP-02 3'-4'	1.00	1324				X									X															
CCV	1.00	1330				X									X															
CCB	1.00	1336				X									X															

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802167

Instrument ID Number: OPTIMA7 Method: P Run Number: W820289A

Start Date: 5/21/2008 End Date: 5/21/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CALIB BLANK 1	1.00	1423											X														
STD1	1.00	1429											X														
STD2	1.00	1434																									
STD3	1.00	1439																									
STD4	1.00	1443																									
STD5	1.00	1447																									
ICV	1.00	1452											X														
ICB	1.00	1457											X														
CRI	1.00	1502											X														
ICSA	1.00	1508											X														
ICSAB	1.00	1514											X														
CCV	1.00	1519											X														
CCB	1.00	1524											X														
PBS	1.00	1532											X														
LCSS	1.00	1538											X														
RAWTP-14 2"-1'	10.00	1543											X														
RAWTP-14 2"-1'MS	10.00	1548											X														
RAWTP-14 2"-1'MSD	10.00	1554											X														
RAWTP-14 1'-2'	1.00	1559											X														
RAWTP-14 2'-3'	1.00	1604											X														
RAWTP-15 2"-1'	1.00	1609											X														
RAWTP-15 1'-2'	1.00	1615											X														
RAWTP-15 2'-3'	1.00	1620											X														
CCV	1.00	1625											X														
CCB	1.00	1630											X														
BFD-3	1.00	1636											X														
RAWTP-16 2"-1'	1.00	1641											X														
RAWTP-16 1'-2'	1.00	1647											X														
RAWTP-16 2'-3'	1.00	1653											X														
RAWTP-16 3'-4'	1.00	1659											X														
RAWTP-18 2"-1'	10.00	1704											X														
RAWTP-18 1'-2'	1.00	1709											X														
RAWTP-18 2'-3'	1.00	1715											X														
RAWTP-18 3'-4'	1.00	1721											X														
RAWTP-19 2"-6"	1.00	1726											X														
CCV	1.00	1732											X														

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802167

Instrument ID Number: OPTIMA7 Method: P Run Number: W820289A

Start Date: 5/21/2008 End Date: 5/21/2008

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CCB	1.00	1737											X															
RAWTP-02 2"-1'	1.00	1743											X															
RAWTP-02 1'-2'	1.00	1749											X															
RAWTP-02 2'-3'	1.00	1755											X															
RAWTP-02 3'-4'	1.00	1800											X															
CCV	1.00	1806											X															
CCB	1.00	1811											X															

Innovative Technical Solutions, Inc.
A Gilbane Company

October 07, 2011

Dr. Casey McKeon
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

RE: ITSI DATA VALIDATION REPORT
RESOLUTION COPPER MINING
HUMAN HEALTH RISK ASSESSMENT
SDG W802167

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) has completed the data review for Resolution Copper Mining (RCM) for its Human Health Risk Assessment (HHRA) soil samples collected in 2008. ITSI performed data review as described in the U.S. Environmental Protection Agency's (EPA) *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004; and the *Sampling and Analysis Plan (SAP) for Clean Closure at Resolution Copper Mining Limited (Resolution), West Plant Site, Superior Mine* , (Golder, June 2005).

The acronym and abbreviations list is included as Appendix A. Data review qualifiers have been marked in red directly on the analytical reports provided by the laboratory and are attached as Appendix B. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C. A summary of the field duplicate pair results is provided in the Field Duplicate Table as Appendix D. Client communications are provided as Appendix E. The ITSI standard legal notice is provided as Appendix F.

1.0 CROSS REFERENCE OF SAMPLES VERIFIED

The analytical data presented in the laboratory Sample Delivery Group (SDG) listed in Table 1 underwent an EPA Level III data validation. The Level III data validation is equivalent to a Step 2A validation, manual (S2AVM) as defined in the *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009). The SDGs contained data for arsenic, copper and lead by EPA Method 6010B.

1501 West Fountainhead Parkway, Suite 350
Tempe, Arizona 85282

(480) 706-6488
fax (480) 704-2952
www.itsi.com

The primary analytical laboratory was SVL of Kellogg, Idaho. Table 1 below provides an analytical summary and cross reference for the samples.

Table 1 Analytical Summary and Cross Reference for Method 6010B

Client Sample ID	Laboratory SDG Number	Date Sampled	Laboratory Report Date	Type
RAWTP-14 2"-1'	W802167-01	4/29/2008	5/21/2008	MS/MSD
RAWTP-14 1'-2'	W802167-02	4/29/2008	5/21/2008	
RAWTP-14 2'-3'	W802167-03	4/29/2008	5/21/2008	
RAWTP-15 2"-1'	W802167-04	4/30/2008	5/21/2008	
RAWTP-15 1'-2'	W802167-05	4/30/2008	5/21/2008	
RAWTP-15 2'-3'	W802167-06	4/30/2008	5/21/2008	PS 1
BFD-3	W802167-07	4/30/2008	5/21/2008	FD 1
RAWTP-16 2"-1'	W802167-08	4/28/2008	5/21/2008	
RAWTP-16 1'-2'	W802167-09	4/28/2008	5/21/2008	
RAWTP-16 2'-3'	W802167-10	4/28/2008	5/21/2008	
RAWTP-16 3'-4'	W802167-11	4/28/2008	5/21/2008	
RAWTP-18 2"-1'	W802167-12	4/29/2008	5/21/2008	
RAWTP-18 1'-2'	W802167-13	4/29/2008	5/21/2008	
RAWTP-18 2'-3'	W802167-14	4/29/2008	5/21/2008	
RAWTP-18 3'-4'	W802167-15	4/29/2008	5/21/2008	
RAWTP-19 2"-6"	W802167-16	4/28/2008	5/21/2008	
RAWTP-02 2"-1'	W802167-17	4/30/2008	5/21/2008	PS 2*
RAWTP-02 1'-2'	W802167-18	4/30/2008	5/21/2008	
RAWTP-02 2'-3'	W802167-19	4/30/2008	5/21/2008	
RAWTP-02 3'-4'	W802167-20	4/30/2008	5/21/2008	

*This sample is the parent sample for BFD-11, which is reported in SDG W802215
FD = Field duplicate sample
MS/MSD = Matrix spike/matrix spike duplicate
PS = Parent sample of field duplicate

The EPA S2AVM data validation included review of the report from the laboratory equivalent to an abbreviated EPA Level III data deliverable with standardized EPA forms. Level III data deliverables contain the sample results and chain-of-custody forms along with basic Quality Control (QC) summaries including surrogate recoveries, method blank results, and precision and accuracy data summaries for the sample preparation batch. As discussed in Section 2.0 below, the laboratory did not include any comments in the case narrative addressing any QC problems.

2.0 LABORATORY REPORT

The data were reported by the laboratory as an EPA Level III deliverable with standardized EPA forms. The data qualifiers noted by the laboratory in the report were

reviewed. Anomalies that required data qualification, if any, are discussed in the sections below. Since the laboratory did not include a case narrative in the report, only the quality control anomalies from the Level III data deliverable could be addressed. Also, there was no official laboratory signature authorizing the release of the report or issue date. ITSI advises that all laboratory reports received by the client contain an official signature authorizing the release of the report and that the issue date should be documented on the report. In addition, the laboratory should provide an officially signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

3.0 SAMPLE INTEGRITY

The Chains-of-Custody (COC) for the April 28 through April 30, 2008 sampling event were available for review. There were no anomalies that required qualification of the data, however, the following COC anomaly was observed.

- The transfer of the samples to the shipping carrier was not documented on the COC. The client indicated that the samplers shipped the samples to SVL via FedEx. ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number. A copy of the communication with the client verifying the transfer of samples to FedEx is provided in Appendix E.

4.0 HOLDING TIME

The samples were analyzed within the recommended method holding time of 180 days after collection.

5.0 INITIAL AND CONTINUING CALIBRATION

The initial and continuing calibrations were not reviewed for this level of validation.

6.0 BLANK EVALUATION

Preparation and equipment blanks were reviewed. The equipment blank(s) associated with the samples are listed in the Data Validation Report (DVR) for SDG W802216. There were no compounds detected in any of the blanks that required qualification of the data.

7.0 LABORATORY CONTROL SAMPLE

A laboratory control sample (LCS) was reported for each analysis. QC results were reviewed using the control limits listed in Table C6 of the SAP. There were no LCS anomalies that required qualification of the data.

8.0 MATRIX SPIKE AND MATRIX SPIKE DUPLICATE

The project matrix spike/matrix spike duplicate (MS/MSD) pair was reviewed using the laboratory control limits of 75 to 125 percent for accuracy and 20 relative percent difference (RPD) for precision. The sample used as the MS/MSD pair is identified in Table 1. There were no MS/MSD anomalies that required qualification of the data.

9.0 REPORTING LIMIT SPIKES

Spikes prepared at the laboratory's reporting limit were reviewed. There were no reporting limit spike anomalies that required qualification of the data.

10.0 COMPOUND QUANTITATION AND IDENTIFICATION

The laboratory reporting limits and quantitative results were reviewed. All reporting limits met the Client Required Detection Limits (CRDLs) listed in the SAP. There were no quantitative anomalies that required qualification of the data, however, the following observation was made.

- There were no units listed on reporting Form 10 for the instrument method detection limits (MDLs) and practical quantitation limits (PQLs) provided with the data package. To provide traceability of laboratory reporting limits from the instrument to the reported data, the laboratory is advised to list the MDL and PQL units on all reporting forms.

11.0 FIELD DUPLICATE SAMPLES

Field duplicate sets were collected and analyzed to measure field and laboratory precision. The results of the field duplicate and parent samples were compared and are summarized in the Field Duplicate Table presented as Appendix D. All field duplicate results were acceptable except as noted below.

- The relative percent differences (RPDs) for arsenic, copper and lead were out of the criteria of less than 35 in field duplicate set RAWTP-15 2'-3' / BFD-3. The associated results have been qualified as "J" for an estimated value.

12.0 RECOMMENDATIONS

ITSI recommends the following actions.

- ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number.

- ITSI advises that all laboratory reports must contain an official signature authorizing the release of the report and that the issue date be documented on the report. Also, the laboratory should provide a properly signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

- ITSI advises the laboratory to list the MDL and PQL units on all reporting forms to provide traceability of laboratory reporting limits from the instrument to the reported data.

13.0 OVERALL ASSESSMENT FOR RCM HHRA APRIL 28 THROUGH APRIL 30, 2008 SAMPLING EVENT

There were no rejected results for this sampling event. Based on the available information, the data as qualified are considered useable for their intended purposes. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C.

We thank you for the opportunity to serve you and look forward to supporting RCM with data review in the future.

Sincerely,

Innovative Technical Solutions, Inc.

Evelyn Dawson, CHMM

Program Chemist

Enclosures:

Appendix A – List of Acronyms and Abbreviations
Appendix B – Qualified Report Pages
Appendix C – Qualified Results Table
Appendix D – Field Duplicate Table
Appendix E – Client Communication
Appendix F – ITSI Standard Legal Notice

cc: John Malusa
Golder Associates, Inc.
4730 North Oracle Road, Suite 210
Tucson, Arizona, 85705

APPENDIX A

LIST OF ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS AND ABBREVIATIONS

COC	chain-of-custody
CRDL	Client Required Detection Limits
EPA	U.S. Environmental Protection Agency
FD	field duplicate
HHRA	Human Health Risk Assessment
ITSI	Innovative Technical Solutions, Inc.
LCS	laboratory control spike
MDL	method detection limits
MS/MSD	matrix spike/matrix spike duplicate
PQL	practical quantitation limits
PS	parent sample
QC	quality control
QRT	Qualified Results Table
RPD	relative percent difference
RCM	Resolution Copper Mining
SAP	Sample Analysis Plan
S2AVM	Step 2A validation, manual
SDG	Sample Delivery Group

APPENDIX B

QUALIFIED REPORT PAGES

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-06 **Client ID:** RAWTP-15 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	59.7 J	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	404 J	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	30.3 J	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

PGC ITSI
30Sep2011

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802167 **Method Type:**

Sample ID: W802167-07 **Client ID:** BFD-3

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration		Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	140	J	mg/Kg			P	0.71	OPTIMA6	W820289
7440-50-8	Copper	874	J	mg/Kg			P	0.29	OPTIMA7	W820289A
7439-92-1	Lead	57.7	J	mg/Kg			P	0.23	OPTIMA6	W820289

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

PGC ITSI

30Sep2011

APPENDIX C

QUALIFIED RESULTS TABLE

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Parameter	Original Value	Added Qualifier	New Value	PQL	MDL	Units	Reason	Validator
W802167-06	RAWTP-15 2'-3'	4/30/2008	Soil	EPA 6010B	Arsenic	59.7	J	59.7 J	2.5	0.71	mg/kg	RPD FD	PGC/EHD
W802167-06	RAWTP-15 2'-3'	4/30/2008	Soil	EPA 6010B	Copper	404	J	404 J	1	0.29	mg/kg	RPD FD	PGC/EHD
W802167-06	RAWTP-15 2'-3'	4/30/2008	Soil	EPA 6010B	Lead	30.3	J	30.3 J	0.75	0.23	mg/kg	RPD FD	PGC/EHD
W802167-07	BFD-3	4/30/2008	Soil	EPA 6010B	Arsenic	140	J	140 J	2.5	0.71	mg/kg	RPD FD	PGC/EHD
W802167-07	BFD-3	4/30/2008	Soil	EPA 6010B	Copper	874	J	874 J	10	0.29	mg/kg	RPD FD	PGC/EHD
W802167-07	BFD-3	4/30/2008	Soil	EPA 6010B	Lead	57.7	J	57.7 J	0.75	0.23	mg/kg	RPD FD	PGC/EHD

Notes

J = estimated value
mg/kg = milligrams per kilogram

FD = field duplicate
MDL = method detection limit
PQL = Practical Quantitation Limit
RPD = relative percent difference

\

APPENDIX D

FIELD DUPLICATE TABLE

Field Duplicate Results
Resolution Copper Mining
Human Health Risk Assessment

Client ID Primary/FD	Laboratory ID Primary/FD	Metal	Sample mg/kg	Duplicate mg/kg	RPD	Agreement (Yes) Non-agreement (No)
RAWTP-15 2'-3' / BFD-3	W802167-06 / W802167-07	Arsenic	59.7	140	80%	No
RAWTP-15 2'-3' / BFD-3	W802167-06 / W802167-07	Copper	404	874	74%	No
RAWTP-15 2'-3' / BFD-3	W802167-06 / W802167-07	Lead	30.3	57.7	62%	No
RAWTP-02 2"-1' / BFD-11	W802167-17 / W802215-02	Arsenic	23.1	21	10%	Yes
RAWTP-02 2"-1' / BFD-11	W802167-17 / W802215-02	Copper	199	148	29%	Yes
RAWTP-02 2"-1' / BFD-11	W802167-17 / W802215-02	Lead	13.3	10.5	24%	Yes

Notes
mg/kg = milligrams per kilogram
FD = field duplicate
No = RPD greater than control limit of 35
Yes = RPD less than control limit of 35
RPD = relative percent difference

APPENDIX E

CLIENT COMMUNICATION

Peggy Cota

From: Morfin, Orestes <Orestes_Morfin@golder.com>
Sent: Tuesday, September 27, 2011 1:52 PM
To: Peggy Cota; Evelyn Dawson
Cc: Malusa, John
Subject: 2008 RAWTP sample shipping

Hello Peggy and Evelyn,
I received an e-mail today from Alejandra Bonilla, one of the two field crew who collected the 2008 RAWTP samples. She confirmed that the samples were shipped to SVL via FedEx.
I hope that helps.
Sincerely,
Orestes

Orestes Morfín (M.Sc.)| Project Hydrogeochemist | **Golder Associates Ltd.**
102, 2535 - 3rd Avenue S.E., Calgary, Alberta, Canada T2A 7W5
T: +1 (403) 299 5600 | **D:** +1 403 513-3574 | **F:** +1 (403) 299-5606 | **C:** +1 | **E:** Orestes_Morfin@golder.com | **www.golder.com**

Work Safe, Home Safe

APPENDIX F

ITSI STANDARD LEGAL NOTICE

ITSI STANDARD LEGAL NOTICE

ITSI is issuing this report at the request of the Client and based upon information furnished by Client. Further, the presence of environmental contamination can be influenced by many factors, including unknown and changing underground conditions. Therefore: 1. This report may not be relied upon by anyone for financial decision-making. 2. No one other than Client is authorized to use this report for any purpose. 3. Any conclusions or opinions included in this report are subject to reasonable revision based upon any new environmental or other data which is later developed. 4. Any results or conclusions stated are to be considered limited by the quality of the underlying sample or other data on which they are based, the budget established by the Client or otherwise for gathering and analyzing data, and by any assumptions and qualifications contained within this report.

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802168 **Method Type:** **SOW No.:** SW-846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802168-01	RAWTP-22 2"-1'	
W802168-02	RAWTP-22 2'-3'	
W802168-03	RAWTP-22 3'-4'	
W802168-04	RAWTP-23 2"-1'	
W802168-05	RAWTP-23 1'-2'	
W802168-06	RAWTP-24 2"-1'	
W802168-07	RAWTP-24 1'-2'	
W802168-08	RAWTP-24 2'-3'	
W802168-09	RAWTP-24 3'-4'	
W802168-10	RAWTP-25 2"-1'	
W802168-11	RAWTP-25 1'-2'	
W802168-12	RAWTP-25 2'-3'	
W802168-13	RAWTP-26 2"-1'	
W802168-14	RAWTP-26 1'-2'	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802168 **Method Type:** **SOW No.:** SW-846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802168-15	RAWTP-27 2"-1'	
W802168-16	RAWTP-27 1'-2'	
W802168-17	BFD-01	
W802168-18	RAWTP-28 2"-1'	
W802168-19	RAWTP-28 1'-2'	
W802168-20	RAWTP-28 2'-3'	
W820290-MS1	RAWTP-22 2"-1'MS	Matrix Spike
W820290-MSD1	RAWTP-22 2"-1'MSD	Matrix Spike Duplicate

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-17 **Client ID:** BFD-01

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	470	mg/Kg		D	P	7.1	OPTIMA6	W820290
7440-50-8	Copper	9280	mg/Kg		D	P	2.9	OPTIMA6	W820290
7439-92-1	Lead	165	mg/Kg		D	P	2.3	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-01 **Client ID:** RAWTP-22 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	755	mg/Kg		D	P	7.1	OPTIMA6	W820290
7440-50-8	Copper	17300	mg/Kg		D	P	2.9	OPTIMA6	W820290
7439-92-1	Lead	326	mg/Kg		D	P	2.3	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-02 **Client ID:** RAWTP-22 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	76.3	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	478	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	20.4	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-03 **Client ID:** RAWTP-22 3'-4'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	36.2	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	349	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	18.1	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-05 **Client ID:** RAWTP-23 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	34.1	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	297	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	21.2	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-04 **Client ID:** RAWTP-23 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	141	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	1420	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	51.8	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-07 **Client ID:** RAWTP-24 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	19.0	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	115	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	15.4	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-06 **Client ID:** RAWTP-24 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	120	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	1200	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	60.4	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-08 **Client ID:** RAWTP-24 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	8.5	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	61.8	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	18.0	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-09 **Client ID:** RAWTP-24 3'-4'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	8.1	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	64.6	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	16.2	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-11 **Client ID:** RAWTP-25 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	14.9	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	116	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	18.4	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-10 **Client ID:** RAWTP-25 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	125	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	792	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	52.9	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-12 **Client ID:** RAWTP-25 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	10.5	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	93.2	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	17.8	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-14 **Client ID:** RAWTP-26 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	19.7	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	95.0	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	18.5	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-13 **Client ID:** RAWTP-26 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	75.0	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	656	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	71.5	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-16 **Client ID:** RAWTP-27 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	131	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	1200	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	47.4	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-15 **Client ID:** RAWTP-27 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	426	mg/Kg		D	P	7.1	OPTIMA6	W820290
7440-50-8	Copper	7750	mg/Kg		D	P	2.9	OPTIMA6	W820290
7439-92-1	Lead	136	mg/Kg		D	P	2.3	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-19 **Client ID:** RAWTP-28 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	55.9	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	257	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	33.9	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-18 **Client ID:** RAWTP-28 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	109	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	915	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	43.7	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-20 **Client ID:** RAWTP-28 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	42.9	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	419	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	22.1	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802168
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV					**Source:** 08E0202				
	Arsenic	2080.60	2000.0	104	90.0 - 110.0	P	5/26/2008	08:45	W820290
	Copper	2005.43	2000.0	100	90.0 - 110.0	P	5/26/2008	08:45	W820290
	Lead	2071.49	2000.0	104	90.0 - 110.0	P	5/26/2008	08:45	W820290
CCV					**Source:** 08E0202				
	Arsenic	2075.68	2000.0	104	90.0 - 110.0	P	5/26/2008	09:13	W820290
	Copper	2023.30	2000.0	101	90.0 - 110.0	P	5/26/2008	09:13	W820290
	Lead	2068.65	2000.0	103	90.0 - 110.0	P	5/26/2008	09:13	W820290
CCV					**Source:** 08E0202				
	Arsenic	2047.49	2000.0	102	90.0 - 110.0	P	5/26/2008	10:32	W820290
	Copper	2024.88	2000.0	101	90.0 - 110.0	P	5/26/2008	10:32	W820290
	Lead	2071.83	2000.0	104	90.0 - 110.0	P	5/26/2008	10:32	W820290
CCV					**Source:** 08E0202				
	Arsenic	2066.75	2000.0	103	90.0 - 110.0	P	5/26/2008	11:41	W820290
	Copper	2037.53	2000.0	102	90.0 - 110.0	P	5/26/2008	11:41	W820290
	Lead	2084.74	2000.0	104	90.0 - 110.0	P	5/26/2008	11:41	W820290
CCV					**Source:** 08E0202				
	Arsenic	2059.38	2000.0	103	90.0 - 110.0	P	5/26/2008	12:16	W820290
	Copper	2017.11	2000.0	101	90.0 - 110.0	P	5/26/2008	12:16	W820290
	Lead	2085.79	2000.0	104	90.0 - 110.0	P	5/26/2008	12:16	W820290

- 2b -
CRDL STANDARD FOR AA & ICP

Client: GOLDER ASSOCIATES **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Advisory Limits (%R)	M	Analysis Date	Analysis Time	Run Number
CRI					**Source:** 08E0089				
	Arsenic	30.22	25.0	121	50 - 150	P	5/26/2008	08:56	W820290
	Copper	7.30	10.0	73	50 - 150	P	5/26/2008	08:56	W820290
	Lead	9.74	7.5	130	50 - 150	P	5/26/2008	08:56	W820290

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/26/2008	08:51	W820290
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/26/2008	08:51	W820290
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/26/2008	08:51	W820290
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/26/2008	09:19	W820290
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/26/2008	09:19	W820290
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/26/2008	09:19	W820290
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/26/2008	10:38	W820290
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/26/2008	10:38	W820290
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/26/2008	10:38	W820290
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/26/2008	11:47	W820290
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/26/2008	11:47	W820290
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/26/2008	11:47	W820290
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/26/2008	12:22	W820290
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/26/2008	12:22	W820290
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/26/2008	12:22	W820290

- 3b -
PREPARATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result (mg/Kg)	Conc Qual	Q	Acceptance Limit	MDL	PQL	M	Analysis Date	Analysis Time	Run
PBS			**SOIL**								
	Arsenic	0.710U			+/-0.710	0.710	2.500	P	5/26/2008	09:34	W820290
	Copper	0.290U			+/-0.290	0.290	1.000	P	5/26/2008	09:34	W820290
	Lead	-0.471J			+/-0.230	0.230	0.750	P	5/26/2008	09:34	W820290

- 4 -

INTERFERENCE CHECK SAMPLE

Client: GOLDER ASSOCIATES **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window	Analysis Date	Analysis Time	Run Number
ICSA					**Source:** 08E0109/08E0110			
	Arsenic	-4.6				5/26/2008	09:02	W820290
	Copper	11000	10000	110	80 - 120%	5/26/2008	09:02	W820290
	Lead	-5.4				5/26/2008	09:02	W820290
ICSAB					**Source:** 08E0109/08E0110			
	Arsenic	507	500	101	80 - 120%	5/26/2008	09:08	W820290
	Copper	539	500	108	80 - 120%	5/26/2008	09:08	W820290
	Lead	476	500	95	80 - 120%	5/26/2008	09:08	W820290

- 5a -

MATRIX SPIKE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802168-01 **Client ID:** RAWTP-22 2"-1'MS

Percent Solids for Sample: 100.00 **Spiked ID:** W820290-MS1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	818.4293		755.2549		100.00	63		P
Copper	mg/Kg	75 - 125	17960.1100		17302.9300		100.00	657		P
Lead	mg/Kg	75 - 125	418.6878		325.8082		100.00	93		P

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802168-01 **Client ID:** RAWTP-22 2"-1'MSD

Percent Solids for Sample: 100.00 **Spiked ID:** W820290-MSD1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	836.9183		755.2549		100.00	82		P
Copper	mg/Kg	75 - 125	18549.1900		17302.9300		100.00	1246		P
Lead	mg/Kg	75 - 125	431.8254		325.8082		100.00	106		P

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W20290-MS1 **Client ID:** RAWTP-22 2"-1'MSD

Percent Solids for Sample: 100.00 **Duplicate ID:** W820290-MSD1 **Percent Solids for Duplicate:** 100.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	mg/Kg		818.4293		836.9183		2		P
Copper	mg/Kg		17960.1100		18549.1900		3		P
Lead	mg/Kg		418.6878		431.8254		3		P

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSS			**LCS Source:**	**QC19115SCSN**			**Batch Number:**	**3050B-05212**
	Arsenic	mg/Kg	100.0	92.4		92	80.0 - 120.0	P
	Copper	mg/Kg	100.0	102.5		102	80.0 - 120.0	P
	Lead	mg/Kg	100.0	97.0		97	80.0 - 120.0	P

- 10 -
METHOD DETECTION LIMITS

Client: GOLDER ASSOCIATES **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

OPTIMA6 **Date:** 8/3/2007

OPT6 GOLDER

Analyte	Wave- length (nm)	MDL	PQL
Arsenic Soil	188.979	7.1	25
Copper Soil	324.752	2.9	10
Lead Soil	220.353	2.3	7.5
Arsenic Water	188.979	8.8	25
Copper Water	324.752	5.8	10
Lead Water	220.353	2.7	7.5

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	Ag
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	-0.0765672	-0.0644665	0.0000000	0.0000000	0.0000000
Arsenic	188.98	-0.0453300	0.0107280	-0.1694960	0.0096547	0.5484170
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.1752050	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	-0.0070810	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0135096	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.1028810	0.0000000
Lead	220.35	-0.1761670	-0.0093275	0.0759093	0.0136395	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0082748	0.0484627	0.0250031	0.0000000
Nickel	232.00	0.0000000	0.0000000	-0.3654500	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	-0.0788700	-0.3467340	-0.1369690	-0.0325080	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0615954	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0247628	0.0255788	-0.0191194	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0833371	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: As	B	Ba	Be	Cd
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.7718580	0.3662240	0.6959020	0.2240050
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.1476010
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	1.0277500	0.0000000	1.3923700	0.0000000
Silver	328.07	11.3802996	0.0000000	0.0940157	0.5006630	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Co	Cr	Cu	K	Mn
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	5.1155200	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.1364940	3.0330999	0.1387400	0.0167062	0.1403420
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	-0.1664470	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	-0.6262930
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	-1.9694901	0.0000000	0.0000000	0.0000000
Lead	220.35	0.1066280	-1.4665800	0.8985730	0.0071050	0.2005910
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.5061610	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	19.8810005	-0.3054260	0.0000000	-0.7663360
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.6312000	0.0000000	0.0000000	0.0217552	1.2965100
Silver	328.07	0.0000000	0.0000000	0.0841744	0.0000000	0.1365200
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	4.0985398	0.5022680	0.0000000	0.0000000	-4.5177302
Vanadium	292.40	0.0000000	-1.9750000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	1.1698000	0.5589550	0.0000000	0.3745840

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Mo	Na	Ni	Pb	Sb
Aluminum	308.22	8.8272104	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	-5.5751901	0.0000000	-0.7057950	0.0000000	0.0000000
Arsenic	188.98	5.8787198	0.0125257	0.0917551	0.0474070	0.2218660
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	-0.0933907	0.0000000	-0.5558650	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	-0.1877540	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.3159850	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	-1.6840400	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	-1.1172400	0.0000000	0.1911460	0.0000000	-0.1528630
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	2.3175099	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.4767700	0.0000000	0.0000000	0.1085480	0.5952360
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0707937	0.0000000
Vanadium	292.40	-8.4443502	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	1.1845100	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6 **Date:** 4/7/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Si	Ti	Tl	V	Zn
Aluminum	308.22	0.0000000	1.8356500	0.0000000	17.3334999	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.6359800	-3.5668099	0.0000000
Arsenic	188.98	0.1542350	-0.4687320	0.1178850	0.4220050	0.1095200
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.1930730	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0563876	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.1992000	0.0000000
Cobalt	228.62	0.0000000	2.0478401	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	-0.7908210	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	3.2859499	0.0000000
Lead	220.35	-0.0611017	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.2394110	0.0000000	0.5458000	0.6221100	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	-0.1198070	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.4468930	0.0000000	2.6794500	0.0000000
Vanadium	292.40	0.0000000	0.6252580	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6 **Date:** 4/8/2008

Analyte	Integration Time (sec)	LDR ug/L	
Arsenic	20.00	9000	OPT6 GOLDER
Copper	20.00	30000	OPT6 GOLDER
Lead	20.00	100000	OPT6 GOLDER

- 13 -
SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802168

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number: 3050B-05212008	**Method:** P						
PBS	PBS	MB	SOIL	5/21/08	1.00	100.0	100.00
LCSS	LCSS	LCS	SOIL	5/21/08	1.00	100.0	100.00
W802168-01	RAWTP-22 2"-1'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W820290-MS1	RAWTP-22 2"-1'MS	MS	SOIL	5/21/08	1.00	100.0	100.00
W820290-MSD1	RAWTP-22 2"-1'MSD	MSD	SOIL	5/21/08	1.00	100.0	100.00
W802168-02	RAWTP-22 2'-3'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-03	RAWTP-22 3'-4'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-04	RAWTP-23 2"-1'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-05	RAWTP-23 1'-2'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-06	RAWTP-24 2"-1'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-07	RAWTP-24 1'-2'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-08	RAWTP-24 2'-3'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-09	RAWTP-24 3'-4'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-10	RAWTP-25 2"-1'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-11	RAWTP-25 1'-2'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-12	RAWTP-25 2'-3'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-13	RAWTP-26 2"-1'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-14	RAWTP-26 1'-2'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-15	RAWTP-27 2"-1'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-16	RAWTP-27 1'-2'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-17	BFD-01	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-18	RAWTP-28 2"-1'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-19	RAWTP-28 1'-2'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802168-20	RAWTP-28 2'-3'	SAM	SOIL	5/21/08	1.00	100.0	100.00

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802168

Instrument ID Number: OPTIMA6 Method: P Run Number: W820290

Start Date: 5/26/2008 End Date: 5/26/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CALIB BLANK 1	1.00	0817				X							X		X											
STD1	1.00	0823				X							X		X											
STD2	1.00	0828																								
STD3	1.00	0833																								
STD4	1.00	0837																								
STD5	1.00	0841																								
ICV	1.00	0845				X							X		X											
ICB	1.00	0851				X							X		X											
CRI	1.00	0856				X							X		X											
ICSA	1.00	0902				X							X		X											
ICSAB	1.00	0908				X							X		X											
CCV	1.00	0913				X							X		X											
CCB	1.00	0919				X							X		X											
PBS	1.00	0934				X							X		X											
LCSS	1.00	0940				X							X		X											
RAWTP-22 2"-1'	10.00	0945				X							X		X											
RAWTP-22 2"-1'MS	10.00	0951				X							X		X											
RAWTP-22 2"-1'MSD	10.00	0957				X							X		X											
RAWTP-22 2'-3'	1.00	1002				X							X		X											
RAWTP-22 3'-4'	1.00	1009				X							X		X											
RAWTP-23 2"-1'	1.00	1014				X							X		X											
RAWTP-23 1'-2'	1.00	1020				X							X		X											
RAWTP-24 2"-1'	1.00	1026				X							X		X											
CCV	1.00	1032				X							X		X											
CCB	1.00	1038				X							X		X											
RAWTP-24 1'-2'	1.00	1043				X							X		X											
RAWTP-24 2'-3'	1.00	1049				X							X		X											
RAWTP-24 3'-4'	1.00	1055				X							X		X											
RAWTP-25 2"-1'	1.00	1101				X							X		X											
RAWTP-25 1'-2'	1.00	1107				X							X		X											
RAWTP-25 2'-3'	1.00	1112				X							X		X											
RAWTP-26 2"-1'	1.00	1118				X							X		X											
RAWTP-26 1'-2'	1.00	1124				X							X		X											
RAWTP-27 2"-1'	10.00	1130				X							X		X											
RAWTP-27 1'-2'	1.00	1135				X							X		X											
CCV	1.00	1141				X							X		X											

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802168

Instrument ID Number: OPTIMA6 Method: P Run Number: W820290

Start Date: 5/26/2008 End Date: 5/26/2008

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CCB	1.00	1147				X							X		X												
BFD-01	10.00	1153				X							X		X												
RAWTP-28 2"-1'	1.00	1158				X							X		X												
RAWTP-28 1'-2'	1.00	1204				X							X		X												
RAWTP-28 2'-3'	1.00	1210				X							X		X												
CCV	1.00	1216				X							X		X												
CCB	1.00	1222				X							X		X												

Innovative Technical Solutions, Inc.
A Gilbane Company

October 07, 2011

Dr. Casey McKeon
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

RE: ITSI DATA VALIDATION REPORT
RESOLUTION COPPER MINING
HUMAN HEALTH RISK ASSESSMENT
SDG W802168

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) has completed the data review for Resolution Copper Mining (RCM) for its Human Health Risk Assessment (HHRA) soil samples collected in 2008. ITSI performed data review as described in the U.S. Environmental Protection Agency's (EPA) *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004; and the *Sampling and Analysis Plan (SAP) for Clean Closure at Resolution Copper Mining Limited (Resolution), West Plant Site, Superior Mine* , (Golder, June 2005).

The acronym and abbreviations list is included as Appendix A. Data review qualifiers have been marked in red directly on the analytical reports provided by the laboratory and are attached as Appendix B. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C. A summary of the field duplicate pair results is provided in the Field Duplicate Table as Appendix D. Client communications are provided as Appendix E. The ITSI standard legal notice is provided as Appendix F.

1.0 CROSS REFERENCE OF SAMPLES VERIFIED

The analytical data presented in the laboratory Sample Delivery Group (SDG) listed in Table 1 underwent an EPA Level III data validation. The Level III data validation is equivalent to a Step 2A validation, manual (S2AVM) as defined in the *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009). The SDGs contained data for arsenic, copper and lead by EPA Method 6010B.

1501 West Fountainhead Parkway, Suite 350
Tempe, Arizona 85282

(480) 706-6488
fax (480) 704-2952
www.itsi.com

The primary analytical laboratory was SVL of Kellogg, Idaho. Table 1 below provides an analytical summary and cross reference for the samples.

Table 1 Analytical Summary and Cross Reference for Method 6010B

Client Sample ID	Laboratory SDG Number	Date Sampled	Type
RAWTP-22 2"-1'	W802168-01	4/28/2008	MS/MSD
RAWTP-22 2'-3'	W802168-02	4/28/2008	
RAWTP-22 3'-4'	W802168-03	4/28/2008	
RAWTP-23 2"-1	W802168-04	4/28/2008	
RAWTP-23 1'-2'	W802168-05	4/28/2008	
RAWTP-24 2"-1'	W802168-06	4/29/2008	
RAWTP-24 1'-2'	W802168-07	4/29/2008	
RAWTP-24 2'-3'	W802168-08	4/29/2008	
RAWTP-24 3'-4'	W802168-09	4/29/2008	
RAWTP-25 2"-1'	W802168-10	4/29/2008	
RAWTP-25 1'-2'	W802168-11	4/29/2008	PS 2*
RAWTP-25 2'-3'	W802168-12	4/29/2008	
RAWTP-26 2"-1'	W802168-13	4/29/2008	
RAWTP-26 1'-2'	W802168-14	4/29/2008	
RAWTP-27 2"-1'	W802168-15	4/28/2008	PS 1
RAWTP-27 1'-2'	W802168-16	4/28/2008	
BFD-01	W802168-17	4/28/2008	FD 1
RAWTP-28 2"-1'	W802168-18	4/28/2008	
RAWTP-28 1'-2'	W802168-19	4/28/2008	
RAWTP-28 2'-3'	W802168-20	4/28/2008	

*RAWTP-25 1'-2' is the parent sample of BFD-9 from SDG W802215
FD = Field duplicate sample
MS/MSD = Matrix spike/matrix spike duplicate
PS = Parent sample of field duplicate

The EPA S2AVM data validation included review of the report from the laboratory equivalent to an abbreviated EPA Level III data deliverable with standardized EPA forms. Level III data deliverables contain the sample results and chain-of-custody forms along with basic Quality Control (QC) summaries including surrogate recoveries, method blank results, and precision and accuracy data summaries for the sample preparation batch. As discussed in Section 2.0 below, the laboratory did not include any comments in the case narrative addressing any QC problems.

2.0 LABORATORY REPORT

The data were reported by the laboratory as an EPA Level III deliverable with standardized EPA forms. The data qualifiers noted by the laboratory in the report were

reviewed. Anomalies that required data qualification, if any, are discussed in the sections below. Since the laboratory did not include a case narrative in the report, only the quality control anomalies from the Level III data deliverable could be addressed. Also, there was no official laboratory signature authorizing the release of the report or issue date. ITSI advises that all laboratory reports received by the client contain an official signature authorizing the release of the report and that the issue date should be documented on the report. In addition, the laboratory should provide an officially signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

3.0 SAMPLE INTEGRITY

The Chains-of-Custody (COC) for the April 28 and April 29, 2008 sampling event were available for review. There were no anomalies that required qualification of the data, however, the following COC anomaly was observed.

- The transfer of the samples to the shipping carrier was not documented on the COC. The client indicated that the samplers shipped the samples to SVL via FedEx. ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number. A copy of the communication with the client verifying the transfer of samples to FedEx is provided in Appendix E.

4.0 HOLDING TIME

The samples were analyzed within the recommended method holding time of 180 days after collection.

5.0 INITIAL AND CONTINUING CALIBRATION

The initial and continuing calibrations were not reviewed for this level of validation.

6.0 BLANK EVALUATION

Preparation and equipment blanks were reviewed. The equipment blank(s) associated with the samples are listed in the Data Validation Report (DVR) for SDG W802216. There were no compounds detected in any of the blanks that required qualification of the data.

7.0 LABORATORY CONTROL SAMPLE

A laboratory control sample (LCS) was reported for each analysis. QC results were reviewed using the control limits listed in Table C6 of the SAP. There were no LCS anomalies that required qualification of the data.

8.0 MATRIX SPIKE AND MATRIX SPIKE DUPLICATE

The project matrix spike/matrix spike duplicate (MS/MSD) pair was reviewed using the laboratory control limits of 75 to 125 percent for accuracy and 20 relative percent difference (RPD) for precision. The sample used as the MS/MSD pair is identified in Table 1. There were no MS/MSD anomalies that required qualification of the data.

9.0 REPORTING LIMIT SPIKES

Spikes prepared at the laboratory's reporting limit were reviewed. There were no reporting limit spike anomalies that required qualification of the data.

10.0 COMPOUND QUANTITATION AND IDENTIFICATION

The laboratory reporting limits and quantitative results were reviewed. All reporting limits met the Client Required Detection Limits (CRDLs) listed in the SAP. There were no quantitative anomalies that required qualification of the data, however, the following observation was made.

- There were no units listed on reporting Form 10 for the instrument method detection limits (MDLs) and practical quantitation limits (PQLs) provided with the data package. To provide traceability of laboratory reporting limits from the instrument to the reported data, the laboratory is advised to list the MDL and PQL units on all reporting forms.

11.0 FIELD DUPLICATE SAMPLES

Field duplicate sets were collected and analyzed to measure field and laboratory precision. The results of the field duplicate and parent samples were compared and are summarized in the Field Duplicate Table presented as Appendix D. All field duplicate results were acceptable except as noted below.

- The relative percent differences (RPDs) for arsenic and copper were out of the criteria of less than 35 percent at 60 and 58 percent in the field duplicate set RAWTP-25 1'-2' / BFD-9. The associated results have been qualified as "J" for

an estimated value. The qualified results for BFD-9 are summarized in the Data Validation Report for SDG W802215.

12.0 RECOMMENDATIONS

ITSI recommends the following actions.

- ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number.

- ITSI advises that all laboratory reports must contain an official signature authorizing the release of the report and that the issue date be documented on the report. Also, the laboratory should provide a properly signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

- ITSI advises the laboratory to list the MDL and PQL units on all reporting forms to provide traceability of laboratory reporting limits from the instrument to the reported data.

13.0 OVERALL ASSESSMENT FOR RCM HHRA APRIL 28 AND APRIL 29 SAMPLING EVENT

There were no rejected results for this sampling event. Based on the available information, the data as qualified are considered useable for their intended purposes. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C.

We thank you for the opportunity to serve you and look forward to supporting RCM with data review in the future.

Sincerely,

Innovative Technical Solutions, Inc.

Evelyn Dawson, CHMM

Program Chemist

Enclosures:

Appendix A – List of Acronyms and Abbreviations
Appendix B – Qualified Report Pages
Appendix C – Qualified Results Table
Appendix D – Field Duplicate Table
Appendix E – Client Communication
Appendix F – ITSI Standard Legal Notice

cc: John Malusa
Golder Associates, Inc.
4730 North Oracle Road, Suite 210
Tucson, Arizona, 85705

APPENDIX A

LIST OF ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS AND ABBREVIATIONS

COC	chain-of-custody
CRDL	Client Required Detection Limits
EPA	U.S. Environmental Protection Agency
FD	field duplicate
HHRA	Human Health Risk Assessment
ITSI	Innovative Technical Solutions, Inc.
LCS	laboratory control spike
MDL	method detection limits
MS/MSD	matrix spike/matrix spike duplicate
PQL	practical quantitation limits
PS	parent sample
QC	quality control
QRT	Qualified Results Table
RPD	relative percent difference
RCM	Resolution Copper Mining
SAP	Sample Analysis Plan
S2AVM	Step 2A validation, manual
SDG	Sample Delivery Group

APPENDIX B

QUALIFIED REPORT PAGES

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802168 **Method Type:**

Sample ID: W802168-11 **Client ID:** RAWTP-25 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	14.9 J	mg/Kg			P	0.71	OPTIMA6	W820290
7440-50-8	Copper	116 J	mg/Kg			P	0.29	OPTIMA6	W820290
7439-92-1	Lead	18.4	mg/Kg			P	0.23	OPTIMA6	W820290

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

PGC ITSI
30Sep2011

APPENDIX C

QUALIFIED RESULTS TABLE

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Parameter	Original Value	Added Qualifier	New Value	PQL	MDL	Units	Reason	Validator
W802168-11	RAWTP-25 1'-2'	5/26/2011	Soil	EPA 6010B	Arsenic	14.9	J	14.9 J	2.5	0.71	mg/kg	RPD FD	PGC/EHD
W802168-11	RAWTP-25 1'-2'	5/26/2011	Soil	EPA 6010B	Copper	116	J	116 J	1	0.29	mg/kg	RPD FD	PGC/EHD

Notes

J = estimated value
mg/kg = milligrams per kilogram

FD = field duplicate
MDL = method detection limit
PQL = Practical Quantitation Limit
RPD = relative percent difference

APPENDIX D

FIELD DUPLICATE TABLE

Field Duplicate Results
Resolution Copper Mining
Human Health Risk Assessment

Client ID Primary/FD	Laboratory ID Primary/FD	Metal	Sample mg/kg	Duplicate mg/kg	RPD	Agreement (Yes) Non-agreement (No)
RAWTP-27 2"-1' / BFD-01	W802168-15 / W802168-17	Arsenic	426	470	10%	Yes
RAWTP-27 2"-1' / BFD-01	W802168-15 / W802168-17	Copper	7750	9280	18%	Yes
RAWTP-27 2"-1' / BFD-01	W802168-15 / W802168-17	Lead	136	165	19%	Yes
RAWTP-25 1'-2' / BFD-9	W802168-11 / W802215-01	Arsenic	14.9	8	60%	No
RAWTP-25 1'-2' / BFD-9	W802168-11 / W802215-01	Copper	116	64.1	58%	No
RAWTP-25 1'-2' / BFD-9	W802168-11 / W802215-01	Lead	18.4	19.2	4%	Yes

Notes

mg/kg = milligrams per kilogram
FD = field duplicate
No = RPD greater than control limit of 35
Yes = RPD less than control limit of 35
RPD = relative percent difference

APPENDIX E

CLIENT COMMUNICATION

Peggy Cota

From: Morfin, Orestes <Orestes_Morfin@golder.com>
Sent: Tuesday, September 27, 2011 1:52 PM
To: Peggy Cota; Evelyn Dawson
Cc: Malusa, John
Subject: 2008 RAWTP sample shipping

Hello Peggy and Evelyn,
I received an e-mail today from Alejandra Bonilla, one of the two field crew who collected the 2008 RAWTP samples. She confirmed that the samples were shipped to SVL via FedEx.
I hope that helps.
Sincerely,
Orestes

Orestes Morfín (M.Sc.)| Project Hydrogeochemist | **Golder Associates Ltd.**
102, 2535 - 3rd Avenue S.E., Calgary, Alberta, Canada T2A 7W5
T: +1 (403) 299 5600 | **D:** +1 403 513-3574 | **F:** +1 (403) 299-5606 | **C:** +1 | **E:** Orestes_Morfin@golder.com | **www.golder.com**

Work Safe, Home Safe

APPENDIX F

ITSI STANDARD LEGAL NOTICE

ITSI STANDARD LEGAL NOTICE

ITSI is issuing this report at the request of the Client and based upon information furnished by Client. Further, the presence of environmental contamination can be influenced by many factors, including unknown and changing underground conditions. Therefore: 1. This report may not be relied upon by anyone for financial decision-making. 2. No one other than Client is authorized to use this report for any purpose. 3. Any conclusions or opinions included in this report are subject to reasonable revision based upon any new environmental or other data which is later developed. 4. Any results or conclusions stated are to be considered limited by the quality of the underlying sample or other data on which they are based, the budget established by the Client or otherwise for gathering and analyzing data, and by any assumptions and qualifications contained within this report.

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: Golder Associates

SDG No.: W802215 **Method Type:** **SOW No.:** SW-846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802215-01	BFD-9	
W802215-02	BFD-11	
W821092-MS1	BFD-9MS	Matrix Spike
W821092-MSD1	BFD-9MSD	Matrix Spike Duplicate

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Golder Associates **SDG No.:** W802215 **Method Type:**

Sample ID: W802215-02 **Client ID:** BFD-11

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	21.0	mg/Kg			P	0.71	OPTIMA1	W821092
7440-50-8	Copper	148	mg/Kg			P	0.29	OPTIMA1	W821092
7439-92-1	Lead	10.5	mg/Kg			P	0.23	OPTIMA1	W821092

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: Golder Associates **SDG No.:** W802215 **Method Type:**

Sample ID: W802215-01 **Client ID:** BFD-9

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	8.0	mg/Kg			P	0.71	OPTIMA1	W821092
7440-50-8	Copper	64.1	mg/Kg			P	0.29	OPTIMA1	W821092
7439-92-1	Lead	19.2	mg/Kg			P	0.23	OPTIMA1	W821092

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Golder Associates **SDG No.:** W802215

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV					**Source:** 08E0153				
	Arsenic	2018.38	2000.0	101	90.0 - 110.0	P	5/23/2008	09:40	W821092
	Copper	1975.19	2000.0	99	90.0 - 110.0	P	5/23/2008	09:40	W821092
	Lead	1953.63	2000.0	98	90.0 - 110.0	P	5/23/2008	09:40	W821092
CCV					**Source:** 08E0153				
	Arsenic	2038.62	2000.0	102	90.0 - 110.0	P	5/23/2008	10:10	W821092
	Copper	1965.87	2000.0	98	90.0 - 110.0	P	5/23/2008	10:10	W821092
	Lead	1961.08	2000.0	98	90.0 - 110.0	P	5/23/2008	10:10	W821092
CCV					**Source:** 08E0153				
	Arsenic	1943.61	2000.0	97	90.0 - 110.0	P	5/23/2008	10:33	W821092
	Copper	1925.50	2000.0	96	90.0 - 110.0	P	5/23/2008	10:33	W821092
	Lead	1888.20	2000.0	94	90.0 - 110.0	P	5/23/2008	10:33	W821092
CCV					**Source:** 08E0153				
	Arsenic	1968.25	2000.0	98	90.0 - 110.0	P	5/23/2008	11:37	W821092
	Copper	1919.41	2000.0	96	90.0 - 110.0	P	5/23/2008	11:37	W821092
	Lead	1911.50	2000.0	96	90.0 - 110.0	P	5/23/2008	11:37	W821092

- 2b -
CRDL STANDARD FOR AA & ICP

Client: Golder Associates **SDG No.:** W802215

Contract: **Lab Code:** SVL **Case No:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Advisory Limits (%R)	M	Analysis Date	Analysis Time	Run Number
CRI					**Source:** 08E0089				
	Arsenic	28.24	25.0	113	50 - 150	P	5/23/2008	09:52	W821092
	Copper	8.21	10.0	82	50 - 150	P	5/23/2008	09:52	W821092
	Lead	4.14	7.5	55	50 - 150	P	5/23/2008	09:52	W821092

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Golder Associates **SDG No.:** W802215

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/23/2008	09:46	W821092
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/23/2008	09:46	W821092
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/23/2008	09:46	W821092
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/23/2008	10:15	W821092
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/23/2008	10:15	W821092
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/23/2008	10:15	W821092
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/23/2008	10:38	W821092
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/23/2008	10:38	W821092
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/23/2008	10:38	W821092
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/23/2008	11:43	W821092
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/23/2008	11:43	W821092
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/23/2008	11:43	W821092

- 3b -
PREPARATION BLANK SUMMARY

Client: Golder Associates **SDG No.:** W802215

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result (mg/Kg)	Conc Qual	Q	Acceptance Limit	MDL	PQL	M	Analysis Date	Analysis Time	Run
PBS			**SOIL**								
	Arsenic	0.710U			+/-0.710	0.710	2.500	P	5/23/2008	11:01	W821092
	Copper	0.290U			+/-0.290	0.290	1.000	P	5/23/2008	11:01	W821092
	Lead	0.230U			+/-0.230	0.230	0.750	P	5/23/2008	11:01	W821092

- 4 -

INTERFERENCE CHECK SAMPLE

Client: Golder Associates **SDG No.:** W802215

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA1

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window	Analysis Date	Analysis Time	Run Number
ICSA					**Source:** 08E0109/08E0110			
	Arsenic	-0.060				5/23/2008	09:58	W821092
	Copper	10800	10000	108	80 - 120%	5/23/2008	09:58	W821092
	Lead	-2.6				5/23/2008	09:58	W821092
ICSAB					**Source:** 08E0109/08E0110			
	Arsenic	497	500	99	80 - 120%	5/23/2008	10:04	W821092
	Copper	531	500	106	80 - 120%	5/23/2008	10:04	W821092
	Lead	472	500	94	80 - 120%	5/23/2008	10:04	W821092

- 5a -

MATRIX SPIKE SUMMARY

Client: Golder Associates **Level:** LOW **SDG No.:** W802215

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802215-01 **Client ID:** BFD-9MS

Percent Solids for Sample: 100.00 **Spiked ID:** W821092-MS1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	103.4866		7.9653		100.00	96		P
Copper	mg/Kg	75 - 125	167.5811		64.0934		100.00	103		P
Lead	mg/Kg	75 - 125	113.7720		19.2095		100.00	95		P

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: Golder Associates **Level:** LOW **SDG No.:** W802215

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802215-01 **Client ID:** BFD-9MSD

Percent Solids for Sample: 100.00 **Spiked ID:** W821092-MSD1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	102.1598		7.9653		100.00	94		P
Copper	mg/Kg	75 - 125	166.4364		64.0934		100.00	102		P
Lead	mg/Kg	75 - 125	113.9120		19.2095		100.00	95		P

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: Golder Associates **Level:** LOW **SDG No.:** W802215

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W821092-MS1 **Client ID:** BFD-9MSD

Percent Solids for Sample: 100.00 **Duplicate ID:** W821092-MSD1 **Percent Solids for Duplicate:** 100.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	mg/Kg		103.4866		102.1598		1		P
Copper	mg/Kg		167.5811		166.4364		1		P
Lead	mg/Kg		113.7720		113.9120		0		P

LABORATORY CONTROL SAMPLE SUMMARY

Client: Golder Associates **SDG No.:** W802215

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSS			**LCS Source:**	**QC19115SCSN**			**Batch Number:**	**3050B-05212**
	Arsenic	mg/Kg	100.0	92.2		92	80.0 - 120.0	P
	Copper	mg/Kg	100.0	100.2		100	80.0 - 120.0	P
	Lead	mg/Kg	100.0	92.7		93	80.0 - 120.0	P

- 10 -
METHOD DETECTION LIMITS

Client: Golder Associates **SDG No.:** W802215

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Analyte	Wave- length (nm)	MDL	PQL
OPTIMA1			**Date:** 12/14/2007
OPT1 GOLDER			
Arsenic Soil	188.979	7.1	25
Copper Soil	324.752	2.9	10
Lead Soil	220.353	2.3	7.5
Arsenic Water	188.979	8.8	25
Copper Water	324.752	5.8	10
Lead Water	220.353	2.7	7.5

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: Golder Associates **SDG No.:** W802215

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA1 **Date:** 4/1/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	As
Aluminum	308.22	0.0000000	0.0131100	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.1071000	0.0000000	-0.0606000	0.0000000	0.0000000
Arsenic	188.98	0.1485000	0.0391000	0.0089000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0240000	0.0010100	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0037000	0.0000000	0.0000000
Cadmium	226.50	-0.0073400	0.0000000	0.1533000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0057000	-0.0191000	0.0000000
Cobalt	228.62	0.0052000	0.0000000	0.0146700	0.0000000	0.0000000
Copper	324.75	0.0078000	0.0000000	-0.0746000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	-0.0309000	0.0000000
Lead	220.35	0.0325000	0.0031000	0.2458000	0.0186000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.2096000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0262000	0.0184000	0.0000000
Nickel	232.00	-0.0011000	0.0116000	-1.5848000	0.0207000	0.1015000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.1266000	0.0218000	-0.1183000	0.0304000	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0953000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0084000	0.0272000	-0.0155000	-0.0538000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0360000	0.0011560	0.0000000
Zinc	206.20	0.0039000	0.0000000	0.0000000	0.0340920	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: Golder Associates **SDG No.:** W802215

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA1 **Date:** 4/1/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Ba	Be	Cd	Co	Cr
Aluminum	308.22	0.6131000	0.0000000	0.0000000	-6.0100002	-0.0110000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	7.6824999
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	-0.0874000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.1931000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	-0.0285000	0.0861000
Calcium	315.89	0.0000000	0.0000000	0.0000000	1.8019000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.2623000	0.0000000	-0.1962000	-0.1072000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	-1.3487000	0.6500000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.4909000	-0.1548000
Nickel	232.00	0.0000000	-0.3557000	0.0000000	0.0096000	33.8223991
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	1.8843000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	3.4152999	0.5573000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	-1.5342000
Zinc	206.20	0.0000000	-0.0327000	0.3972000	0.0000000	-0.5552000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: Golder Associates **SDG No.:** W802215

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA1 **Date:** 4/1/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Cu	K	Mn	Mo	Ni
Aluminum	308.22	0.0000000	0.0000000	0.0000000	5.7308002	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.4777000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0081900	-0.3819000	0.0050000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0220600	0.0000000	-0.0048000	-0.0345000	-0.5721900
Calcium	315.89	0.0000000	0.0000000	0.0000000	1.4406700	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0330000	-0.1309000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.1714390
Copper	324.75	0.0000000	0.0000000	0.0000000	0.7193000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.8628000	0.0000000	0.2609600	-0.7003500	0.0335000
Magnesium	279.08	0.0000000	0.0028000	-5.3892002	-6.2502999	0.1948000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0329000	0.0000000
Nickel	232.00	-0.4576000	0.0000000	-3.1677001	4.2866001	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.9083000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.2081400	0.0987000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	-9.5826998	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	-0.0639000	-6.8871999	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.1280000	0.6149000	-0.2085000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: Golder Associates **SDG No.:** W802215

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA1 **Date:** 4/1/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: P	Sb	Se	Si	Sn
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	1.1009001
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	-2.0701001
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0344000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0144000	-0.1669400	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	-0.1009000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.1645000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.1446000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.6663000	0.1814000	0.1363000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: Golder Associates **SDG No.:** W802215

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA1 **Date:** 4/1/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Ti	U	V	Zn	La
Aluminum	308.22	1.4739000	-6.5716400	12.6000996	0.0000000	
Antimony	206.84	0.0000000	-1.0741000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	-1.8369000	0.0000000	0.0000000	0.0000000	29.4022999
Barium	233.53	0.0000000	-0.1777000	-1.2400000	0.0033000	0.0000000
Beryllium	313.11	0.0825000	-0.3040000	0.0664000	0.0000000	0.0000000
Cadmium	226.50	0.0606770	-0.1451000	0.0000000	0.0000000	-0.1140000
Calcium	315.89	0.0000000	5.3004999	-1.6645000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.6494000	0.3242000	0.0000000	0.0000000
Cobalt	228.62	1.8609999	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.2501000	0.8966000	0.0000000	0.0000000	-0.0474000
Iron	273.96	0.0000000	-1.7112000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.7484000	0.0000000	-0.0112000	0.1145000
Magnesium	279.08	-1.2385000	5.7515998	-0.1741000	0.0000000	0.0000000
Manganese	260.57	0.0000000	-0.1178000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.7481000	0.3127000	0.0000000	-0.5781000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	-2.3810999	0.0000000	0.0000000	-1.2065500
Silver	328.07	0.0000000	0.7301860	-0.0570000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	-0.7083000	0.1363600	2.4705000	0.0000000	0.0000000
Vanadium	292.40	0.5177000	-1.0334001	0.0000000	0.0000000	0.2382700
Zinc	206.20	0.0000000	0.0000000	-0.0877000	0.0000000	0.0000000

- 12 -
LINEAR RANGES

Client: Golder Associates **SDG No.:** W802215
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**
Instrument ID: OPTIMA1 **Date:** 5/6/2007

Analyte	Integration Time (sec)	LDR ug/L	
Arsenic	20.00	30000	OPT1 GOLDER
Copper	20.00	100000	OPT1 GOLDER
Lead	20.00	50000	OPT1 GOLDER

- 13 -
SAMPLE PREPARATION SUMMARY

Client: Golder Associates **SDG No.:** W802215

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number: 3050B-05212008	**Method:** P						
PBS	PBS	MB	SOIL	5/21/08	1.00	100.0	100.00
LCSS	LCSS	LCS	SOIL	5/21/08	1.00	100.0	100.00
W802215-01	BFD-9	SAM	SOIL	5/21/08	1.00	100.0	100.00
W821092-MS1	BFD-9MS	MS	SOIL	5/21/08	1.00	100.0	100.00
W821092-MSD1	BFD-9MSD	MSD	SOIL	5/21/08	1.00	100.0	100.00
W802215-02	BFD-11	SAM	SOIL	5/21/08	1.00	100.0	100.00

14

ANALYSIS RUN LOG

Client: Golder Associates Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802215

Instrument ID Number: OPTIMA1 Method: P Run Number: W821092

Start Date: 5/23/2008 End Date: 5/23/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN			
CALIB BLANK 1	1.00	0912				X							X		X															
STD1	1.00	0918				X							X		X															
STD2	1.00	0924																												
STD3	1.00	0928																												
STD4	1.00	0932																												
STD5	1.00	0936																												
ICV	1.00	0940				X							X		X															
ICB	1.00	0946				X							X		X															
CRI	1.00	0952				X							X		X															
ICSA	1.00	0958				X							X		X															
ICSAB	1.00	1004				X							X		X															
CCV	1.00	1010				X							X		X															
CCB	1.00	1015				X							X		X															
ZZZZZZ	1.00	1026																												
CCV	1.00	1033				X							X		X															
CCB	1.00	1038				X							X		X															
PBS	1.00	1101				X							X		X															
LCSS	1.00	1107				X							X		X															
BFD-9	1.00	1113				X							X		X															
BFD-9MS	1.00	1119				X							X		X															
BFD-9MSD	1.00	1125				X							X		X															
BFD-11	1.00	1131				X							X		X															
CCV	1.00	1137				X							X		X															
CCB	1.00	1143				X							X		X															

Innovative Technical Solutions, Inc.
A Gilbane Company

October 07, 2011

Dr. Casey McKeon
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

RE: ITSI DATA VALIDATION REPORT
RESOLUTION COPPER MINING
HUMAN HEALTH RISK ASSESSMENT
SDG W802215

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) has completed the data review for Resolution Copper Mining (RCM) for its Human Health Risk Assessment (HHRA) soil samples collected in 2008. ITSI performed data review as described in the U.S. Environmental Protection Agency's (EPA) *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004; and the *Sampling and Analysis Plan (SAP) for Clean Closure at Resolution Copper Mining Limited (Resolution), West Plant Site, Superior Mine* , (Golder, June 2005).

The acronym and abbreviations list is included as Appendix A. Data review qualifiers have been marked in red directly on the analytical reports provided by the laboratory and are attached as Appendix B. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C. A summary of the field duplicate pair results is provided in the Field Duplicate Table as Appendix D. Client communications are provided as Appendix E. The ITSI standard legal notice is provided as Appendix F.

1.0 CROSS REFERENCE OF SAMPLES VERIFIED

The analytical data presented in the laboratory Sample Delivery Group (SDG) listed in Table 1 underwent an EPA Level III data validation. The Level III data validation is equivalent to a Step 2A validation, manual (S2AVM) as defined in the *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009). The SDGs contained data for arsenic, copper and lead by EPA Method 6010B.

1501 West Fountainhead Parkway, Suite 350
Tempe, Arizona 85282

(480) 706-6488
fax (480) 704-2952
www.itsi.com

The primary analytical laboratory was SVL of Kellogg, Idaho. Table 1 below provides an analytical summary and cross reference for the samples.

Table 1 Analytical Summary and Cross Reference for Method 6010B

Client Sample ID	Laboratory SDG Number	Date Sampled	Type
BFD-9	W802215-01	4/29/2008	MS/MSD FD**
BFD-11	W802215-02	4/30/2008	FD**
RAWTP-25-RB-01	*	4/29/2008	RB
RAWTP-RB-03	*	5/01/2008	RB
DRB-TP18	*	4/29/2008	RB
RAWTP-RB-02	*	4/30/2008	RB

*Rinse blank samples are logged in under SDG W802216
**BFD-9 is the FD of sample RAWTP-25 1'-2' from SDG W802168;
BFD-11 is the FD of sample RAWTP-02 2"-1' from SDG W802167
FD = Field duplicate sample
MS/MSD = Matrix spike/matrix spike duplicate

The EPA S2AVM data validation included review of the report from the laboratory equivalent to an abbreviated EPA Level III data deliverable with standardized EPA forms. Level III data deliverables contain the sample results and chain-of-custody forms along with basic Quality Control (QC) summaries including surrogate recoveries, method blank results, and precision and accuracy data summaries for the sample preparation batch. As discussed in Section 2.0 below, the laboratory did not include any comments in the case narrative addressing any QC problems.

2.0 LABORATORY REPORT

The data were reported by the laboratory as an EPA Level III deliverable with standardized EPA forms. The data qualifiers noted by the laboratory in the report were reviewed. Anomalies that required data qualification, if any, are discussed in the sections below. Since the laboratory did not include a case narrative in the report, only the quality control anomalies from the Level III data deliverable could be addressed. Also, there was no official laboratory signature authorizing the release of the report or issue date. ITSI advises that all laboratory reports received by the client contain an official signature authorizing the release of the report and that the issue date should be documented on the report. In addition, the laboratory should provide an officially signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

3.0 SAMPLE INTEGRITY

The Chains-of-Custody (COC) for the April 29 and April 30, 2008 sampling event were available for review. The rinse blanks listed on the COC were logged in under SDG W802215 with the other rinse blanks. There were no anomalies that required qualification of the data, however, the following COC anomaly was observed.

- The transfer of the samples to the shipping carrier was not documented on the COC. The client indicated that the samplers shipped the samples to SVL via FedEx. ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number. A copy of the communication with the client verifying the transfer of samples to FedEx is provided in Appendix E.

4.0 HOLDING TIME

The samples were analyzed within the recommended method holding time of 180 days after collection.

5.0 INITIAL AND CONTINUING CALIBRATION

The initial and continuing calibrations were not reviewed for this level of validation.

6.0 BLANK EVALUATION

Preparation and equipment blanks were reviewed. The equipment blank(s) associated with the samples are listed in the Data Validation Report (DVR) for SDG W802216. There were no compounds detected in any of the blanks that required qualification of the data.

7.0 LABORATORY CONTROL SAMPLE

A laboratory control sample (LCS) was reported for each analysis. QC results were reviewed using the control limits listed in Table C6 of the SAP. There were no LCS anomalies that required qualification of the data.

8.0 MATRIX SPIKE AND MATRIX SPIKE DUPLICATE

The project matrix spike/matrix spike duplicate (MS/MSD) pair was reviewed using the laboratory control limits of 75 to 125 percent for accuracy and 20 relative percent

difference (RPD) for precision. The sample used as the MS/MSD pair is identified in Table 1. There were no MS/MSD anomalies that required qualification of the data.

9.0 REPORTING LIMIT SPIKES

Spikes prepared at the laboratory's reporting limit were reviewed. There were no reporting limit spike anomalies that required qualification of the data.

10.0 COMPOUND QUANTITATION AND IDENTIFICATION

The laboratory reporting limits and quantitative results were reviewed. All reporting limits met the Client Required Detection Limits (CRDLs) listed in the SAP. There were no quantitative anomalies that required qualification of the data, however, the following observation was made.

- There were no units listed on reporting Form 10 for the instrument method detection limits (MDLs) and practical quantitation limits (PQLs) provided with the data package. To provide traceability of laboratory reporting limits from the instrument to the reported data, the laboratory is advised to list the MDL and PQL units on all reporting forms.

11.0 FIELD DUPLICATE SAMPLES

Field duplicate sets were collected and analyzed to measure field and laboratory precision. The results of the field duplicate and parent samples were compared and are summarized in the Field Duplicate Table presented as Appendix D. All field duplicate results were acceptable except as noted below.

- The relative percent differences (RPDs) for arsenic and copper were out of the criteria of less than 35 percent at 60 and 58 percent in the field duplicate set RAWTP-25 1'-2' / BFD-9. The associated results have been qualified as "J" for an estimated value. The qualified results for RAWTP-25 1'-2' are summarized in the Data Validation Report for SDG W802168.

12.0 RECOMMENDATIONS

ITSI recommends the following actions.

- ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number.

- ITSI advises that all laboratory reports must contain an official signature authorizing the release of the report and that the issue date be documented on the report. Also, the laboratory should provide a properly signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

- ITSI advises the laboratory to list the MDL and PQL units on all reporting forms to provide traceability of laboratory reporting limits from the instrument to the reported data.

13.0 OVERALL ASSESSMENT FOR RCM HHRA APRIL 29 AND APRIL 30, 2008 SAMPLING EVENT

There were no rejected results for this sampling event. Based on the available information, the data as qualified are considered useable for their intended purposes. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C.

We thank you for the opportunity to serve you and look forward to supporting RCM with data review in the future.

Sincerely,

Innovative Technical Solutions, Inc.

Evelyn Dawson, CHMM

Program Chemist

Enclosures:

Appendix A – List of Acronyms and Abbreviations
Appendix B – Qualified Report Pages
Appendix C – Qualified Results Table
Appendix D – Field Duplicate Table
Appendix E – Client Communication
Appendix F – ITSI Standard Legal Notice

cc: John Malusa
Golder Associates, Inc.
4730 North Oracle Road, Suite 210
Tucson, Arizona, 85705

APPENDIX A

LIST OF ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS AND ABBREVIATIONS

COC	chain-of-custody
CRDL	Client Required Detection Limits
EPA	U.S. Environmental Protection Agency
FD	field duplicate
HHRA	Human Health Risk Assessment
ITSI	Innovative Technical Solutions, Inc.
LCS	laboratory control spike
MDL	method detection limits
MS/MSD	matrix spike/matrix spike duplicate
PQL	practical quantitation limits
PS	parent sample
QC	quality control
QRT	Qualified Results Table
RPD	relative percent difference
RCM	Resolution Copper Mining
SAP	Sample Analysis Plan
S2AVM	Step 2A validation, manual
SDG	Sample Delivery Group

APPENDIX B

QUALIFIED REPORT PAGES

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Golder Associates **SDG No.:** W802215 **Method Type:**

Sample ID: W802215-01 **Client ID:** BFD-9

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/7/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	8.0 J	mg/Kg			P	0.71	OPTIMA1	W821092
7440-50-8	Copper	64.1 J	mg/Kg			P	0.29	OPTIMA1	W821092
7439-92-1	Lead	19.2	mg/Kg			P	0.23	OPTIMA1	W821092

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

PGC ITSI
30Sep2011

APPENDIX C

QUALIFIED RESULTS TABLE

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Parameter	Original Value	Added Qualifier	New Value	PQL	MDL	Units	Reason	Validator
W802215-01	BFD-9	4/29/2011	Soil	EPA 6010B	Arsenic	8	J	8 J	2.5	0.71	mg/kg	RPD FD	PGC/EHD
W802215-01	BFD-9	4/29/2011	Soil	EPA 6010B	Copper	64.1	J	64.1 J	1	0.29	mg/kg	RPD FD	PGC/EHD

Notes
J = estimated value
mg/kg = milligrams per kilogram

FD = field duplicate
MDL = method detection limit
PQL = Practical Quantitation Limit
RPD = relative percent difference

APPENDIX D

FIELD DUPLICATE TABLE

Field Duplicate Results
Resolution Copper Mining
Human Health Risk Assessment

Client ID Primary/FD	Laboratory ID Primary/FD	Metal	Sample mg/kg	Duplicate mg/kg	RPD	Agreement (Yes) Non-agreement (No)
RAWTP-02 2"-1' / BFD-11	W802167-17 / W802215-02	Arsenic	23.1	21	10%	Yes
RAWTP-02 2"-1' / BFD-11	W802167-17 / W802215-02	Copper	199	148	29%	Yes
RAWTP-02 2"-1' / BFD-11	W802167-17 / W802215-02	Lead	13.3	10.5	24%	Yes
RAWTP-25 1'-2' / BFD-9	W802168-11 / W802215-01	Arsenic	14.9	8	60%	No
RAWTP-25 1'-2' / BFD-9	W802168-11 / W802215-01	Copper	116	64.1	58%	No
RAWTP-25 1'-2' / BFD-9	W802168-11 / W802215-01	Lead	18.4	19.2	4%	Yes

Notes
mg/kg = milligrams per kilogram
FD = field duplicate
No = RPD greater than control limit of 35
Yes = RPD less than control limit of 35
RPD = relative percent difference

APPENDIX E

CLIENT COMMUNICATION

Peggy Cota

From: Morfin, Orestes <Orestes_Morfin@golder.com>
Sent: Tuesday, September 27, 2011 1:52 PM
To: Peggy Cota; Evelyn Dawson
Cc: Malusa, John
Subject: 2008 RAWTP sample shipping

Hello Peggy and Evelyn,
I received an e-mail today from Alejandra Bonilla, one of the two field crew who collected the 2008 RAWTP samples. She confirmed that the samples were shipped to SVL via FedEx.
I hope that helps.
Sincerely,
Orestes

Orestes Morfín (M.Sc.)| Project Hydrogeochemist | **Golder Associates Ltd.**
102, 2535 - 3rd Avenue S.E., Calgary, Alberta, Canada T2A 7W5
T: +1 (403) 299 5600 | **D:** +1 403 513-3574 | **F:** +1 (403) 299-5606 | **C:** +1 | **E:** Orestes_Morfin@golder.com | **www.golder.com**

Work Safe, Home Safe

APPENDIX F

ITSI STANDARD LEGAL NOTICE

ITSI STANDARD LEGAL NOTICE

ITSI is issuing this report at the request of the Client and based upon information furnished by Client. Further, the presence of environmental contamination can be influenced by many factors, including unknown and changing underground conditions. Therefore: 1. This report may not be relied upon by anyone for financial decision-making. 2. No one other than Client is authorized to use this report for any purpose. 3. Any conclusions or opinions included in this report are subject to reasonable revision based upon any new environmental or other data which is later developed. 4. Any results or conclusions stated are to be considered limited by the quality of the underlying sample or other data on which they are based, the budget established by the Client or otherwise for gathering and analyzing data, and by any assumptions and qualifications contained within this report.

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802216 **Method Type:** **SOW No.:** SW846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802216-01	DRB-TP18	
W802216-02	RAWTP-RB-02	
W802216-03	DRB-TP06	
W802216-04	DRB-TP07	
W802216-05	RAWTP-25 RB-01	
W802216-06	RAWTP-RB-03	
W819254-MS1	RAWTP-RB-03MS	Matrix Spike
W819254-MSD1	RAWTP-RB-03MSD	Matrix Spike Duplicate
W819255-MS1	DRB-TP18MS	Matrix Spike
W819255-MSD1	DRB-TP18MSD	Matrix Spike Duplicate
W820057-DUP1	DRB-TP18D	Sample Duplicate
W820057-MS1	DRB-TP18MS	Matrix Spike
W820057-MSD1	DRB-TP18MSD	Matrix Spike Duplicate

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802216 **Method Type:**

Sample ID: W802216-03 **Client ID:** DRB-TP06

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Date Received:** 5/7/2008 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-36-0	Antimony	0.14	ug/L	J		MS	0.10	PE ICPMS DRC-E	134D
7440-38-2	Arsenic	2.0	ug/L	J		MS	0.14	PE ICPMS DRC-E	134D
7440-39-3	Barium	0.48	ug/L	U		P	0.48	OPTIMA5	W819255
7440-41-7	Beryllium	0.36	ug/L	U		P	0.36	OPTIMA5	W819255
7440-43-9	Cadmium	0.96	ug/L	U		P	0.96	OPTIMA5	W819255A
7440-47-3	Chromium	1.0	ug/L	U		P	1.0	OPTIMA5	W819255
7440-50-8	Copper	12.9	ug/L			P	5.8	OPTIMA5	W819255
7439-92-1	Lead	2.7	ug/L	U		P	2.7	OPTIMA5	W819255
7439-97-6	Mercury	0.064	ug/L	U		CV	0.064	Cetac M6000 Hg	X0513A
7440-02-0	Nickel	2.3	ug/L	U		P	2.3	OPTIMA5	W819255
7782-49-2	Selenium	0.10	ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-28-0	Thallium	0.02	ug/L	U		MS	0.02	PE ICPMS DRC-E	134D

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802216 **Method Type:**

Sample ID: W802216-04 **Client ID:** DRB-TP07

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Date Received:** 5/7/2008 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-36-0	Antimony	0.10	ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-38-2	Arsenic	1.4	ug/L	J		MS	0.14	PE ICPMS DRC-E	134D
7440-39-3	Barium	0.54	ug/L	J		P	0.48	OPTIMA5	W819255
7440-41-7	Beryllium	0.36	ug/L	U		P	0.36	OPTIMA5	W819255
7440-43-9	Cadmium	0.96	ug/L	U		P	0.96	OPTIMA5	W819255A
7440-47-3	Chromium	1.0	ug/L	U		P	1.0	OPTIMA5	W819255
7440-50-8	Copper	5.8	ug/L	U		P	5.8	OPTIMA5	W819255
7439-92-1	Lead	2.7	ug/L	U		P	2.7	OPTIMA5	W819255
7439-97-6	Mercury	0.064	ug/L	U		CV	0.064	Cetac M6000 Hg	X0513A
7440-02-0	Nickel	2.3	ug/L	U		P	2.3	OPTIMA5	W819255
7782-49-2	Selenium	0.10	ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-28-0	Thallium	0.02	ug/L	U		MS	0.02	PE ICPMS DRC-E	134D

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802216 **Method Type:**

Sample ID: W802216-01 **Client ID:** DRB-TP18

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Date Received:** 5/7/2008 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-36-0	Antimony	0.32	ug/L	J		MS	0.10	PE ICPMS DRC-E	134D
7440-38-2	Arsenic	7.3	ug/L			MS	0.14	PE ICPMS DRC-E	134D
7440-39-3	Barium	1.0	ug/L	J		P	0.48	OPTIMA5	W819255
7440-41-7	Beryllium	0.36	ug/L	U		P	0.36	OPTIMA5	W819255
7440-43-9	Cadmium	0.96	ug/L	U		P	0.96	OPTIMA5	W819255A
7440-47-3	Chromium	1.0	ug/L	U		P	1.0	OPTIMA5	W819255
7440-50-8	Copper	77.7	ug/L			P	5.8	OPTIMA5	W819255
7439-92-1	Lead	2.7	ug/L	U		P	2.7	OPTIMA5	W819255
7439-97-6	Mercury	0.064	ug/L	U		CV	0.064	Cetac M6000 Hg	X0513A
7440-02-0	Nickel	2.3	ug/L	U		P	2.3	OPTIMA5	W819255
7782-49-2	Selenium	0.10	ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-28-0	Thallium	0.02	ug/L	U		MS	0.02	PE ICPMS DRC-E	134D

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802216 **Method Type:**

Sample ID: W802216-05 **Client ID:** RAWTP-25 RB-01

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Date Received:** 5/7/2008 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-36-0	Antimony	0.10	ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-38-2	Arsenic	0.86	ug/L	J		MS	0.14	PE ICPMS DRC-E	134D
7440-39-3	Barium	0.48	ug/L	U		P	0.48	OPTIMA5	W819255
7440-41-7	Beryllium	0.36	ug/L	U		P	0.36	OPTIMA5	W819255
7440-43-9	Cadmium	0.96	ug/L	U		P	0.96	OPTIMA5	W819255A
7440-47-3	Chromium	1.0	ug/L	U		P	1.0	OPTIMA5	W819255
7440-50-8	Copper	5.8	ug/L	U		P	5.8	OPTIMA5	W819255
7439-92-1	Lead	2.7	ug/L	U		P	2.7	OPTIMA5	W819255
7439-97-6	Mercury	0.064	ug/L	U		CV	0.064	Cetac M6000 Hg	X0513A
7440-02-0	Nickel	2.3	ug/L	U		P	2.3	OPTIMA5	W819255
7782-49-2	Selenium	0.10	ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-28-0	Thallium	0.02	ug/L	U		MS	0.02	PE ICPMS DRC-E	134D

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802216 **Method Type:**

Sample ID: W802216-02 **Client ID:** RAWTP-RB-02

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Date Received:** 5/7/2008 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-36-0	Antimony	0.10	ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-38-2	Arsenic	1.3	ug/L	J		MS	0.14	PE ICPMS DRC-E	134D
7440-39-3	Barium	0.48	ug/L	U		P	0.48	OPTIMA5	W819255
7440-41-7	Beryllium	0.36	ug/L	U		P	0.36	OPTIMA5	W819255
7440-43-9	Cadmium	0.96	ug/L	U		P	0.96	OPTIMA5	W819255A
7440-47-3	Chromium	1.0	ug/L	U		P	1.0	OPTIMA5	W819255
7440-50-8	Copper	5.8	ug/L	U		P	5.8	OPTIMA5	W819255
7439-92-1	Lead	2.7	ug/L	U		P	2.7	OPTIMA5	W819255
7439-97-6	Mercury	0.064	ug/L	U		CV	0.064	Cetac M6000 Hg	X0513A
7440-02-0	Nickel	2.3	ug/L	U		P	2.3	OPTIMA5	W819255
7782-49-2	Selenium	0.10	ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-28-0	Thallium	0.02	ug/L	U		MS	0.02	PE ICPMS DRC-E	134D

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802216 **Method Type:**

Sample ID: W802216-06 **Client ID:** RAWTP-RB-03

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Date Received:** 5/7/2008 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-36-0	Antimony	0.13	ug/L	J		MS	0.10	PE ICPMS DRC-E	134D
7440-38-2	Arsenic	1.1	ug/L	J		MS	0.14	PE ICPMS DRC-E	134D
7440-39-3	Barium	0.48	ug/L	U		P	0.48	OPTIMA5	W819255
7440-41-7	Beryllium	0.36	ug/L	U		P	0.36	OPTIMA5	W819255
7440-43-9	Cadmium	0.96	ug/L	U		P	0.96	OPTIMA5	W819255A
7440-47-3	Chromium	1.0	ug/L	U		P	1.0	OPTIMA5	W819255
7440-50-8	Copper	5.8	ug/L	U		P	5.8	OPTIMA5	W819255
7439-92-1	Lead	2.7	ug/L	U		P	2.7	OPTIMA5	W819255
7439-97-6	Mercury	0.064	ug/L	U		CV	0.064	Cetac M6000 Hg	X0513A
7440-02-0	Nickel	2.3	ug/L	U		P	2.3	OPTIMA5	W819255
7782-49-2	Selenium	0.11	ug/L	J		MS	0.10	PE ICPMS DRC-E	134D
7440-28-0	Thallium	0.02	ug/L	U		MS	0.02	PE ICPMS DRC-E	134D

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802216
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV					**Source:** 22-47-5				
	Antimony	25.06	25.0	100	90.0 - 110.0	MS	5/13/2008	12:17	134D
	Arsenic	25.65	25.0	103	90.0 - 110.0	MS	5/13/2008	12:17	134D
	Selenium	26.10	25.0	104	90.0 - 110.0	MS	5/13/2008	12:17	134D
	Thallium	25.73	25.0	103	90.0 - 110.0	MS	5/13/2008	12:17	134D
CCV					**Source:** 22-47-4				
	Antimony	49.59	50.0	99	90.0 - 110.0	MS	5/13/2008	12:26	134D
	Arsenic	48.64	50.0	97	90.0 - 110.0	MS	5/13/2008	12:26	134D
	Selenium	47.16	50.0	94	90.0 - 110.0	MS	5/13/2008	12:26	134D
	Thallium	51.05	50.0	102	90.0 - 110.0	MS	5/13/2008	12:26	134D
CCV					**Source:** 22-47-4				
	Antimony	49.94	50.0	100	90.0 - 110.0	MS	5/13/2008	12:51	134D
	Arsenic	50.42	50.0	101	90.0 - 110.0	MS	5/13/2008	12:51	134D
	Selenium	49.14	50.0	98	90.0 - 110.0	MS	5/13/2008	12:51	134D
	Thallium	50.88	50.0	102	90.0 - 110.0	MS	5/13/2008	12:51	134D
CCV					**Source:** 22-47-4				
	Antimony	49.93	50.0	100	90.0 - 110.0	MS	5/13/2008	12:57	134D
	Arsenic	49.98	50.0	100	90.0 - 110.0	MS	5/13/2008	12:57	134D
	Selenium	48.95	50.0	98	90.0 - 110.0	MS	5/13/2008	12:57	134D
	Thallium	49.75	50.0	100	90.0 - 110.0	MS	5/13/2008	12:57	134D
ICV					**Source:** 08E0063				
	Barium	2038.41	2000.0	102	90.0 - 110.0	P	5/12/2008	16:34	W819255
	Beryllium	2037.49	2000.0	102	90.0 - 110.0	P	5/12/2008	16:34	W819255
	Chromium	2040.22	2000.0	102	90.0 - 110.0	P	5/12/2008	16:34	W819255
	Copper	2027.26	2000.0	101	90.0 - 110.0	P	5/12/2008	16:34	W819255
	Lead	2043.48	2000.0	102	90.0 - 110.0	P	5/12/2008	16:34	W819255
	Nickel	2040.52	2000.0	102	90.0 - 110.0	P	5/12/2008	16:34	W819255

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802216
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV					**Source:** 08E0063				
	Barium	2066.81	2000.0	103	90.0 - 110.0	P	5/12/2008	17:04	W819255
	Beryllium	2004.95	2000.0	100	90.0 - 110.0	P	5/12/2008	17:04	W819255
	Chromium	2067.63	2000.0	103	90.0 - 110.0	P	5/12/2008	17:04	W819255
	Copper	2037.77	2000.0	102	90.0 - 110.0	P	5/12/2008	17:04	W819255
	Lead	2063.69	2000.0	103	90.0 - 110.0	P	5/12/2008	17:04	W819255
	Nickel	2064.84	2000.0	103	90.0 - 110.0	P	5/12/2008	17:04	W819255
CCV					**Source:** 08E0063				
	Barium	2147.70	2000.0	107	90.0 - 110.0	P	5/12/2008	18:15	W819255
	Beryllium	2146.21	2000.0	107	90.0 - 110.0	P	5/12/2008	18:15	W819255
	Chromium	2148.12	2000.0	107	90.0 - 110.0	P	5/12/2008	18:15	W819255
	Copper	2128.83	2000.0	106	90.0 - 110.0	P	5/12/2008	18:15	W819255
	Lead	2144.10	2000.0	107	90.0 - 110.0	P	5/12/2008	18:15	W819255
	Nickel	2145.04	2000.0	107	90.0 - 110.0	P	5/12/2008	18:15	W819255
CCV					**Source:** 08E0063				
	Barium	2043.31	2000.0	102	90.0 - 110.0	P	5/12/2008	18:33	W819255
	Beryllium	1988.11	2000.0	99	90.0 - 110.0	P	5/12/2008	18:33	W819255
	Chromium	2043.08	2000.0	102	90.0 - 110.0	P	5/12/2008	18:33	W819255
	Copper	1994.72	2000.0	100	90.0 - 110.0	P	5/12/2008	18:33	W819255
	Lead	2030.41	2000.0	102	90.0 - 110.0	P	5/12/2008	18:33	W819255
	Nickel	2022.26	2000.0	101	90.0 - 110.0	P	5/12/2008	18:33	W819255
ICV					**Source:** 08E0063				
	Cadmium	2084.25	2000.0	104	90.0 - 110.0	P	5/13/2008	07:32	W819255A
CCV					**Source:** 08E0063				
	Cadmium	1947.81	2000.0	97	90.0 - 110.0	P	5/13/2008	08:01	W819255A
CCV					**Source:** 08E0063				
	Cadmium	1978.71	2000.0	99	90.0 - 110.0	P	5/13/2008	09:52	W819255A
ICV					**Source:** 08D0161				
	Mercury	4.94	5.0	99	80.0 - 120.0	CV	5/13/2008	09:31	X0513A

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV					**Source:** 08D0161				
	Mercury	1.97	2.0	98	80.0 - 120.0	CV	5/13/2008	09:35	X0513A
CCV					**Source:** 08D0161				
	Mercury	2.09	2.0	104	80.0 - 120.0	CV	5/13/2008	09:54	X0513A
CCV					**Source:** 08D0161				
	Mercury	2.14	2.0	107	80.0 - 120.0	CV	5/13/2008	09:59	X0513A

- 2b -
CRDL STANDARD FOR AA & ICP

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Advisory Limits (%R)	M	Analysis Date	Analysis Time	Run Number
CRI					**Source:** 08E0089				
	Barium	2.21	2.0	110	50 - 150	P	5/12/2008	16:46	W819255
	Beryllium	2.03	2.0	102	50 - 150	P	5/12/2008	16:46	W819255
	Chromium	6.35	6.0	106	50 - 150	P	5/12/2008	16:46	W819255
	Copper	9.42	10.0	94	50 - 150	P	5/12/2008	16:46	W819255
	Lead	5.61	7.5	75	50 - 150	P	5/12/2008	16:46	W819255
	Nickel	9.00	10.0	90	50 - 150	P	5/12/2008	16:46	W819255
CRI					**Source:** 08E0089				
	Cadmium	1.92	2.0	96	50 - 150	P	5/13/2008	07:43	W819255A

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Antimony	0.196	+/-0.480	J	0.100	0.480	MS	5/13/2008	12:19	134D
	Arsenic	0.223	+/-1.200	J	0.140	1.200	MS	5/13/2008	12:19	134D
	Selenium	0.100	+/-1.200	U	0.100	1.200	MS	5/13/2008	12:19	134D
	Thallium	0.019	+/-0.160	J	0.018	0.160	MS	5/13/2008	12:19	134D
CCB										
	Antimony	0.151	+/-0.480	J	0.100	0.480	MS	5/13/2008	12:28	134D
	Arsenic	0.561	+/-1.200	J	0.140	1.200	MS	5/13/2008	12:28	134D
	Selenium	0.100	+/-1.200	U	0.100	1.200	MS	5/13/2008	12:28	134D
	Thallium	0.018	+/-0.160	U	0.018	0.160	MS	5/13/2008	12:28	134D
CCB										
	Antimony	0.224	+/-0.480	J	0.100	0.480	MS	5/13/2008	12:53	134D
	Arsenic	0.293	+/-1.200	J	0.140	1.200	MS	5/13/2008	12:53	134D
	Selenium	0.100	+/-1.200	U	0.100	1.200	MS	5/13/2008	12:53	134D
	Thallium	0.018	+/-0.160	U	0.018	0.160	MS	5/13/2008	12:53	134D
CCB										
	Antimony	0.183	+/-0.480	J	0.100	0.480	MS	5/13/2008	12:59	134D
	Arsenic	0.562	+/-1.200	J	0.140	1.200	MS	5/13/2008	12:59	134D
	Selenium	0.100	+/-1.200	U	0.100	1.200	MS	5/13/2008	12:59	134D
	Thallium	0.018	+/-0.160	U	0.018	0.160	MS	5/13/2008	12:59	134D
ICB										
	Barium	0.480	+/-2.000	U	0.480	2.000	P	5/12/2008	16:40	W819255
	Beryllium	0.360	+/-2.000	U	0.360	2.000	P	5/12/2008	16:40	W819255
	Chromium	1.000	+/-6.000	U	1.000	6.000	P	5/12/2008	16:40	W819255
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/12/2008	16:40	W819255
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/12/2008	16:40	W819255
	Nickel	2.300	+/-10.000	U	2.300	10.000	P	5/12/2008	16:40	W819255

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Barium	0.480	+/-2.000	U	0.480	2.000	P	5/12/2008	17:10	W819255
	Beryllium	0.360	+/-2.000	U	0.360	2.000	P	5/12/2008	17:10	W819255
	Chromium	1.000	+/-6.000	U	1.000	6.000	P	5/12/2008	17:10	W819255
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/12/2008	17:10	W819255
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/12/2008	17:10	W819255
	Nickel	2.300	+/-10.000	U	2.300	10.000	P	5/12/2008	17:10	W819255
CCB										
	Barium	0.480	+/-2.000	U	0.480	2.000	P	5/12/2008	18:21	W819255
	Beryllium	0.360	+/-2.000	U	0.360	2.000	P	5/12/2008	18:21	W819255
	Chromium	1.000	+/-6.000	U	1.000	6.000	P	5/12/2008	18:21	W819255
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/12/2008	18:21	W819255
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/12/2008	18:21	W819255
	Nickel	2.300	+/-10.000	U	2.300	10.000	P	5/12/2008	18:21	W819255
CCB										
	Barium	0.480	+/-2.000	U	0.480	2.000	P	5/12/2008	18:38	W819255
	Beryllium	0.360	+/-2.000	U	0.360	2.000	P	5/12/2008	18:38	W819255
	Chromium	1.000	+/-6.000	U	1.000	6.000	P	5/12/2008	18:38	W819255
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/12/2008	18:38	W819255
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/12/2008	18:38	W819255
	Nickel	2.300	+/-10.000	U	2.300	10.000	P	5/12/2008	18:38	W819255
ICB										
	Cadmium	0.960	+/-2.000	U	0.960	2.000	P	5/13/2008	07:38	W819255A
CCB										
	Cadmium	0.960	+/-2.000	U	0.960	2.000	P	5/13/2008	08:07	W819255A
CCB										
	Cadmium	0.960	+/-2.000	U	0.960	2.000	P	5/13/2008	08:40	W819255A

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB	Cadmium	0.960	+/-2.000	U	0.960	2.000	P	5/13/2008	09:58	W819255A
ICB	Mercury	0.064	+/-0.200	U	0.064	0.200	CV	5/13/2008	09:33	X0513A
CCB	Mercury	0.064	+/-0.200	U	0.064	0.200	CV	5/13/2008	09:37	X0513A
CCB	Mercury	0.064	+/-0.200	U	0.064	0.200	CV	5/13/2008	09:56	X0513A
CCB	Mercury	0.064	+/-0.200	U	0.064	0.200	CV	5/13/2008	10:01	X0513A

- 3b -
PREPARATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result (ug/L)	Conc Qual	Q	Acceptance Limit	MDL	PQL	M	Analysis Date	Analysis Time	Run
W819254-BLK1			**WATER**								
	Antimony	0.100U			+/-0.100	0.100	1.200	MS	5/13/2008	12:30	134D
	Arsenic	1.086J			+/-0.140	0.140	3.000	MS	5/13/2008	12:30	134D
	Selenium	0.104J			+/-0.100	0.100	3.000	MS	5/13/2008	12:30	134D
	Thallium	0.018U			+/-0.018	0.018	0.400	MS	5/13/2008	12:30	134D
PBW			**WATER**								
	Barium	0.480U			+/-0.480	0.480	2.000	P	5/12/2008	17:18	W819255
	Beryllium	0.360U			+/-0.360	0.360	2.000	P	5/12/2008	17:18	W819255
	Cadmium	0.960U			+/-0.960	0.960	2.000	P	5/13/2008	08:54	W819255A
	Chromium	1.000U			+/-1.000	1.000	6.000	P	5/12/2008	17:18	W819255
	Copper	5.800U			+/-5.800	5.800	10.000	P	5/12/2008	17:18	W819255
	Lead	-3.074J			+/-2.700	2.700	7.500	P	5/12/2008	17:18	W819255
	Nickel	2.300U			+/-2.300	2.300	10.000	P	5/12/2008	17:18	W819255
W820057-BLK1			**WATER**								
	Mercury	0.064U			+/-0.064	0.064	0.200	CV	5/13/2008	09:38	X0513A

- 4 -

INTERFERENCE CHECK SAMPLE

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: PE ICPMS DRC-E

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window	Analysis Date	Analysis Time	Run Number
ICSA					**Source:** 08B0012/08B0013			
	Antimony	0.092				5/13/2008	12:21	134D
	Arsenic	0.82				5/13/2008	12:21	134D
	Selenium	-0.14				5/13/2008	12:21	134D
	Thallium	0.011				5/13/2008	12:21	134D
ICSAB					**Source:** 08B0012/08B0013			
	Antimony	0.060				5/13/2008	12:24	134D
	Arsenic	10.7	10.000	107	80 - 120%	5/13/2008	12:24	134D
	Selenium	9.8	10.000	98	80 - 120%	5/13/2008	12:24	134D
	Thallium	0.021				5/13/2008	12:24	134D
ICSA					**Source:** 08E0059/08E0060			
	Barium	3.7				5/12/2008	16:52	W819255
	Beryllium	1.3				5/12/2008	16:52	W819255
	Chromium	9770	10000	98	80 - 120%	5/12/2008	16:52	W819255
	Copper	11900	10000	119	80 - 120%	5/12/2008	16:52	W819255
	Lead	-9.8				5/12/2008	16:52	W819255
	Nickel	11500	10000	115	80 - 120%	5/12/2008	16:52	W819255
ICSAB					**Source:** 08E0059/08E0060			
	Barium	518	500	104	80 - 120%	5/12/2008	16:58	W819255
	Beryllium	508	500	102	80 - 120%	5/12/2008	16:58	W819255
	Chromium	487	500	97	80 - 120%	5/12/2008	16:58	W819255
	Copper	583	500	117	80 - 120%	5/12/2008	16:58	W819255
	Lead	490	500	98	80 - 120%	5/12/2008	16:58	W819255
	Nickel	495	500	99	80 - 120%	5/12/2008	16:58	W819255
ICSA					**Source:** 08E0059/08E0060			
	Cadmium	3.1				5/13/2008	07:49	W819255A
ICSAB					**Source:** 08E0059/08E0060			
	Cadmium	447	500	89	80 - 120%	5/13/2008	07:55	W819255A

- 5a -

MATRIX SPIKE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Sample ID:** W802216-01 **Client ID:** DRB-TP18MS

Percent Solids for Sample: 0.00 **Spiked ID:** W819255-MS1 **Percent Solids for Spike Sample:** 0.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Barium	ug/L	70 - 130	1068.6860		0.9967	J	1000.00	107		P
Beryllium	ug/L	70 - 130	1027.5440		0.3600	U	1000.00	103		P
Cadmium	ug/L	70 - 130	980.3789		0.9600	U	1000.00	98		P
Chromium	ug/L	70 - 130	1082.0500		1.0000	U	1000.00	108		P
Copper	ug/L	70 - 130	1153.1590		77.6980		1000.00	108		P
Lead	ug/L	70 - 130	1084.6200		2.7000	U	1000.00	108		P
Mercury	ug/L	75 - 125	1.0500		0.0640	U	1.00	105		CV
Nickel	ug/L	70 - 130	1050.9750		2.3000	U	1000.00	105		P

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Sample ID:** W802216-01 **Client ID:** DRB-TP18MSD

Percent Solids for Sample: 0.00 **Spiked ID:** W819255-MSD1 **Percent Solids for Spike Sample:** 0.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Barium	ug/L	70 - 130	1014.8050		0.9967	J	1000.00	101		P
Beryllium	ug/L	70 - 130	1043.8780		0.3600	U	1000.00	104		P
Cadmium	ug/L	70 - 130	1001.2620		0.9600	U	1000.00	100		P
Chromium	ug/L	70 - 130	1031.5480		1.0000	U	1000.00	103		P
Copper	ug/L	70 - 130	1098.2730		77.6980		1000.00	102		P
Lead	ug/L	70 - 130	1039.1760		2.7000	U	1000.00	104		P
Mercury	ug/L	75 - 125	1.0700		0.0640	U	1.00	107		CV
Nickel	ug/L	70 - 130	1002.7790		2.3000	U	1000.00	100		P

- 5a -

MATRIX SPIKE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Sample ID:** W802216-06 **Client ID:** RAWTP-RB-03MS

Percent Solids for Sample: 0.00 **Spiked ID:** W819254-MS1 **Percent Solids for Spike Sample:** 0.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Antimony	ug/L	75 - 125	24.8273		0.2500	U	25.00	99		MS
Arsenic	ug/L	75 - 125	24.4318		1.0563	J	25.00	94		MS
Selenium	ug/L	75 - 125	21.5955		0.2500	U	25.00	86		MS
Thallium	ug/L	75 - 125	25.0390		0.0450	U	25.00	100		MS

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Sample ID:** W802216-06 **Client ID:** RAWTP-RB-03MSD

Percent Solids for Sample: 0.00 **Spiked ID:** W819254-MSD1 **Percent Solids for Spike Sample:** 0.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Antimony	ug/L	75 - 125	24.2618		0.2500	U	25.00	97		MS
Arsenic	ug/L	75 - 125	23.9925		1.0563	J	25.00	92		MS
Selenium	ug/L	75 - 125	21.5460		0.2500	U	25.00	86		MS
Thallium	ug/L	75 - 125	25.3385		0.0450	U	25.00	101		MS

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Sample ID:** W802216-01 **Client ID:** DRB-TP18D

Percent Solids for Sample: 0.00 **Duplicate ID:** W820057-DUP1 **Percent Solids for Duplicate:** 0.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Mercury	ug/L		0.0640	U	0.0640	U			CV

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Sample ID:** W819255-MS1 **Client ID:** DRB-TP18MSD

Percent Solids for Sample: 0.00 **Duplicate ID:** W819255-MSD1 **Percent Solids for Duplicate:** 0.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Barium	ug/L		1068.6863		1014.8050		5		P
Beryllium	ug/L		1027.5445		1043.8780		2		P
Cadmium	ug/L		980.3789		1001.2620		2		P
Chromium	ug/L		1082.0495		1031.5480		5		P
Copper	ug/L		1153.1595		1098.2730		5		P
Lead	ug/L		1084.6204		1039.1760		4		P
Mercury	ug/L		1.0500		1.0700		2		CV
Nickel	ug/L		1050.9746		1002.7790		5		P

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Sample ID:** W819254-MS1 **Client ID:** RAWTP-RB-03MSD

Percent Solids for Sample: 0.00 **Duplicate ID:** W819254-MSD1 **Percent Solids for Duplicate:** 0.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Antimony	ug/L		24.8272		24.2618		2		MS
Arsenic	ug/L		24.4318		23.9925		2		MS
Selenium	ug/L		21.5955		21.5460		0		MS
Thallium	ug/L		25.0390		25.3385		1		MS

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSW			**LCS Source:**	**QC19115SCSN**			**Batch Number:**	**EPA 3005-0**
	Barium	ug/L	1000.0	1063.89		106	85.0 - 115.0	P
	Beryllium	ug/L	1000.0	1073.21		107	85.0 - 115.0	P
	Cadmium	ug/L	1000.0	966.13		97	85.0 - 115.0	P
	Chromium	ug/L	1000.0	1078.99		108	85.0 - 115.0	P
	Copper	ug/L	1000.0	1063.82		106	85.0 - 115.0	P
	Lead	ug/L	1000.0	1077.89		108	85.0 - 115.0	P
	Nickel	ug/L	1000.0	1044.93		104	85.0 - 115.0	P
W819254-BS1			**LCS Source:**	**08A0087**			**Batch Number:**	**EPA 3020A-**
	Antimony	ug/L	25.0	24.61		98	80.0 - 120.0	MS
	Arsenic	ug/L	25.0	23.82		95	80.0 - 120.0	MS
	Selenium	ug/L	25.0	22.29		89	80.0 - 120.0	MS
	Thallium	ug/L	25.0	25.15		101	80.0 - 120.0	MS
W820057-BS1			**LCS Source:**	**08D0161**			**Batch Number:**	**EPA 7470A-**
	Mercury	ug/L	5.0	5.11		102	83.5 - 118.0	CV

- 10 -
METHOD DETECTION LIMITS

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Cetac M6000 Hg **Date:** 1/7/2008

SW846

Analyte	Wave- length (nm)	MDL	PQL
		ug/L	ug/L
Mercury	253.70	0.064	0.20

OPTIMA5 **Date:** 2/11/2008

OPT5 GOLDER

Analyte	Wave- length (nm)	MDL	PQL
		ug/L	ug/L
Barium	233.527	0.48	2
Beryllium	313.107	0.36	2
Cadmium	226.502	0.96	2
Chromium	267.716	1.0	6
Copper	324.752	5.8	10
Lead	220.353	2.7	8
Nickel	232.003	2.3	10

PE ICPMS DRC-E **Date:** 1/7/2008

COMM 6020

Analyte	Wave- length (nm)	MDL	PQL
		ug/L	ug/L
Antimony	121	0.10	1.2
Arsenic	75	0.14	3.0
Selenium	82	0.10	3.0
Thallium	205	0.018	0.4

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA5 **Date:** 4/4/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	Ag
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	-0.0437999	0.0000000	0.0408321	0.0000000	0.0000000
Arsenic	188.98	-0.0051872	0.0000000	0.0000000	0.0053922	0.8023340
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	-0.0041094	0.0000000	0.1902620	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0184321	0.0118780	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0567697	0.0000000
Lead	220.35	-0.0785731	-0.0077438	0.0166316	0.0074316	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0558488	0.0257812	0.0000000
Nickel	232.00	0.0000000	0.0000000	-0.9836570	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	-0.0202395	0.0000000	-0.0972076	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0463997	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	-0.0530207	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0712195	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0313481	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA5 **Date:** 4/4/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: As	Ba	Be	Cd	Co
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	-1.8695500
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.1866050	0.0000000	0.0000000	-0.3650900
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.2612720	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	-0.4265570
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.5709890
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.7065560	0.0000000	1.4516000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	1.1105900
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA5 **Date:** 4/4/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Cr	Cu	Mn	Mo	Na
Aluminum	308.22	0.0000000	0.0000000	0.0000000	17.4125004	0.0000000
Antimony	206.84	9.4869299	0.0000000	0.0000000	-4.7805800	0.0000000
Arsenic	188.98	1.0163400	0.0000000	0.0000000	2.2904899	0.0065611
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	-0.0745369	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	-0.0847830	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0611494	0.0000000	-0.1615550	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.2502760	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.6885690	0.1640430	-1.4733599	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	33.1503983	-0.4727670	-2.2425399	3.9440100	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.8720790	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.1483010	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.3013240	0.0000000	-2.4701900	0.0000000	0.0000000
Vanadium	292.40	-2.0251999	0.0000000	0.0000000	-7.7170501	0.0000000
Zinc	206.20	0.0000000	0.6035490	0.3771380	0.8993580	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA5 **Date:** 4/4/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Ni	Pb	Sb	Si	Ti
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	2.5661600
Antimony	206.84	-0.9826560	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0308934	0.0000000	0.0000000	-2.5350699
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0485710
Cadmium	226.50	-0.6658500	0.0000000	0.0000000	0.0000000	0.2439670
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	2.3056700
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	-0.4633660
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	-1.1737000
Lead	220.35	-0.3088640	0.0000000	-0.0880853	-0.1309840	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.4578570
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.6209380
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA5 **Date:** 4/4/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Tl	V			
Aluminum	308.22	0.0000000	14.3895998			
Antimony	206.84	0.6631970	-0.6592910			
Arsenic	188.98	0.0000000	0.2876220			
Barium	233.53	0.0000000	0.0000000			
Beryllium	313.11	0.0000000	0.0000000			
Cadmium	226.50	0.0000000	0.0000000			
Calcium	315.89	0.0000000	0.0000000			
Chromium	267.72	0.0000000	0.1499040			
Cobalt	228.62	0.0000000	0.0000000			
Copper	324.75	0.0000000	0.0000000			
Iron	273.96	0.0000000	3.3234301			
Lead	220.35	0.0000000	0.0000000			
Magnesium	279.08	0.0000000	0.0000000			
Manganese	260.57	0.0000000	0.0000000			
Nickel	232.00	0.0000000	0.0000000			
Potassium	766.49	0.0000000	0.0000000			
Selenium	196.03	0.0000000	0.0000000			
Silver	328.07	0.0000000	-0.1136500			
Sodium	589.59	0.0000000	0.0000000			
Thallium	190.80	0.0000000	0.8801670			
Vanadium	292.40	0.0000000	0.0000000			
Zinc	206.20	0.0000000	0.0000000			

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W802216
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**
Instrument ID: OPTIMA5 **Date:** 4/6/2008

Analyte	Integration Time (sec)	LDR ug/L	
Barium	20.00	30000	OPT5 GOLDER
Beryllium	20.00	50000	OPT5 GOLDER
Cadmium	20.00	30000	OPT5 GOLDER
Chromium	20.00	50000	OPT5 GOLDER
Copper	20.00	30000	OPT5 GOLDER
Lead	20.00	100000	OPT5 GOLDER
Nickel	20.00	20000	OPT5 GOLDER

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W802216
Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**
Instrument ID: PE ICPMS DRC-E **Date:** 1/3/2008

Analyte	Integration Time (sec)	LDR ug/L	
Antimony	1.00	4000	COMM 6020
Arsenic	1.00	4000	COMM 6020
Selenium	1.00	1000	COMM 6020
Thallium	1.00	3000	COMM 6020

- 13 -
SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(mL)	Final Sample Volume (mL)	Percent Solids
Batch Number: EPA 3005-05092008 **Method:** P							
PBW	PBW	MB	WATER	5/9/08	50.0	50.0	
LCSW	LCSW	LCS	WATER	5/9/08	50.0	50.0	
W802216-01	DRB-TP18	SAM	WATER	5/9/08	50.0	50.0	
W819255-MS1	DRB-TP18MS	MS	WATER	5/9/08	50.0	50.0	
W819255-MSD1	DRB-TP18MSD	MSD	WATER	5/9/08	50.0	50.0	
W802216-02	RAWTP-RB-02	SAM	WATER	5/9/08	50.0	50.0	
W802216-03	DRB-TP06	SAM	WATER	5/9/08	50.0	50.0	
W802216-04	DRB-TP07	SAM	WATER	5/9/08	50.0	50.0	
W802216-05	RAWTP-25 RB-01	SAM	WATER	5/9/08	50.0	50.0	
W802216-06	RAWTP-RB-03	SAM	WATER	5/9/08	50.0	50.0	

- 13 -
SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(mL)	Final Sample Volume (mL)	Percent Solids
Batch Number: EPA 3020A-05092008	**Method:** MS						
W819254-BLK1	PBW	MB	WATER	5/9/08	20.0	50.0	
W819254-BS1	LCSW	LCS	WATER	5/9/08	20.0	50.0	
W802216-01	DRB-TP18	SAM	WATER	5/9/08	20.0	50.0	
W802216-02	RAWTP-RB-02	SAM	WATER	5/9/08	20.0	50.0	
W819254-MS1	RAWTP-RB-03MS	MS	WATER	5/9/08	20.0	50.0	
W819254-MSD1	RAWTP-RB-03MSD	MSD	WATER	5/9/08	20.0	50.0	
W802216-03	DRB-TP06	SAM	WATER	5/9/08	20.0	50.0	
W802216-04	DRB-TP07	SAM	WATER	5/9/08	20.0	50.0	
W802216-05	RAWTP-25 RB-01	SAM	WATER	5/9/08	20.0	50.0	
W802216-06	RAWTP-RB-03	SAM	WATER	5/9/08	20.0	50.0	

- 13 -
SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802216

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(mL)	Final Sample Volume (mL)	Percent Solids
Batch Number: EPA 7470A-05122008 **Method:** CV							
S0	S0	CAL	WATER	5/12/08	50.0	50.0	
S0.2	S0.2	CAL	WATER	5/12/08	50.0	50.0	
S0.5	S0.5	CAL	WATER	5/12/08	50.0	50.0	
S1	S1	CAL	WATER	5/12/08	50.0	50.0	
S2	S2	CAL	WATER	5/12/08	50.0	50.0	
S5	S5	CAL	WATER	5/12/08	50.0	50.0	
S10	S10	CAL	WATER	5/12/08	50.0	50.0	
ICV	ICV	ICV	WATER	5/12/08	50.0	50.0	
ICB	ICB	ICB	WATER	5/12/08	50.0	50.0	
CCV1	CCV	CCV	WATER	5/12/08	50.0	50.0	
CCB1	CCB	CCB	WATER	5/12/08	50.0	50.0	
W820057-BLK1	PBW	MB	WATER	5/12/08	50.0	50.0	
W820057-BS1	LCSW	LCS	WATER	5/12/08	50.0	50.0	
W802216-01	DRB-TP18	SAM	WATER	5/12/08	50.0	50.0	
W820057-DUP1	DRB-TP18D	DUP	WATER	5/12/08	50.0	50.0	
W820057-MS1	DRB-TP18MS	MS	WATER	5/12/08	50.0	50.0	
W820057-MSD1	DRB-TP18MSD	MSD	WATER	5/12/08	50.0	50.0	
W802216-02	RAWTP-RB-02	SAM	WATER	5/12/08	50.0	50.0	
W802216-03	DRB-TP06	SAM	WATER	5/12/08	50.0	50.0	
W802216-04	DRB-TP07	SAM	WATER	5/12/08	50.0	50.0	
W802216-05	RAWTP-25 RB-01	SAM	WATER	5/12/08	50.0	50.0	
CCV2	CCV	CCV	WATER	5/12/08	50.0	50.0	
CCB2	CCB	CCB	WATER	5/12/08	50.0	50.0	
W802216-06	RAWTP-RB-03	SAM	WATER	5/12/08	50.0	50.0	
CCV3	CCV	CCV	WATER	5/12/08	50.0	50.0	
CCB3	CCB	CCB	WATER	5/12/08	50.0	50.0	

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802216

Instrument ID Number: PE ICPMS DRC-E Method: MS Run Number: 134D

Start Date: 5/13/2008 End Date: 5/13/2008

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
Cal Blank	1.00	1203			X	X															X			X			
Cal Std 1	1.00	1205			X	X															X			X			
Cal Std 2	1.00	1207			X	X															X			X			
Cal Std 3	1.00	1209			X	X															X			X			
Cal Std 4	1.00	1211			X	X															X			X			
Cal Std 5	1.00	1213			X	X															X			X			
Cal Std 6	1.00	1215			X	X															X			X			
ICV	1.00	1217			X	X															X			X			
ICB	1.00	1219			X	X															X			X			
ICSA	1.00	1221			X	X															X			X			
ICSAB	1.00	1224			X	X															X			X			
CCV	1.00	1226			X	X															X			X			
CCB	1.00	1228			X	X															X			X			
PBW	1.00	1230			X	X															X			X			
LCSW	1.00	1232			X	X															X			X			
DRB-TP18	1.00	1234			X	X															X			X			
RAWTP-RB-02	1.00	1236			X	X															X			X			
RAWTP-RB-03L	5.00	1238			X	X															X			X			
RAWTP-RB-03MS	1.00	1240			X	X															X			X			
RAWTP-RB-03MSD	1.00	1242			X	X															X			X			
DRB-TP06	1.00	1244			X	X															X			X			
DRB-TP07	1.00	1246			X	X															X			X			
RAWTP-25 RB-01	1.00	1249			X	X															X			X			
CCV	1.00	1251			X	X															X			X			
CCB	1.00	1253			X	X															X			X			
RAWTP-RB-03	1.00	1255			X	X															X			X			
CCV	1.00	1257			X	X															X			X			
CCB	1.00	1259			X	X															X			X			

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802216

Instrument ID Number: OPTIMA5 Method: P Run Number: W819255

Start Date: 5/12/2008 End Date: 5/12/2008

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CALIB BLANK 1	1.00	1604					X	X			X		X		X				X								
STD1	1.00	1610					X	X			X		X		X				X								
STD2	1.00	1616																									
STD3	1.00	1620																									
STD4	1.00	1625																									
STD5	1.00	1629																									
ICV	1.00	1634					X	X			X		X		X				X								
ICB	1.00	1640					X	X			X		X		X				X								
CRI	1.00	1646					X	X			X		X		X				X								
ICSA	1.00	1652					X	X			X		X		X				X								
ICSAB	1.00	1658					X	X			X		X		X				X								
CCV	1.00	1704					X	X			X		X		X				X								
CCB	1.00	1710					X	X			X		X		X				X								
PBW	1.00	1718					X	X			X		X		X				X								
LCSW	1.00	1724					X	X			X		X		X				X								
DRB-TP18	1.00	1730					X	X			X		X		X				X								
DRB-TP18MS	1.00	1735					X	X			X		X		X				X								
DRB-TP18MSD	1.00	1741					X	X			X		X		X				X								
ZZZZZZ	1.00	1747																									
RAWTP-RB-02	1.00	1752					X	X			X		X		X				X								
DRB-TP06	1.00	1758					X	X			X		X		X				X								
DRB-TP07	1.00	1804					X	X			X		X		X				X								
RAWTP-25 RB-01	1.00	1810					X	X			X		X		X				X								
CCV	1.00	1815					X	X			X		X		X				X								
CCB	1.00	1821					X	X			X		X		X				X								
RAWTP-RB-03	1.00	1827					X	X			X		X		X				X								
CCV	1.00	1833					X	X			X		X		X				X								
CCB	1.00	1838					X	X			X		X		X				X								

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802216

Instrument ID Number: OPTIMA5 Method: P Run Number: W819255A

Start Date: 5/13/2008 End Date: 5/13/2008

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CALIB BLANK 1	1.00	0702							X																		
STD1	1.00	0708							X																		
STD2	1.00	0714																									
STD3	1.00	0718																									
STD4	1.00	0723																									
STD5	1.00	0727																									
ICV	1.00	0732							X																		
ICB	1.00	0738							X																		
CRI	1.00	0743							X																		
ICSA	1.00	0749							X																		
ICSAB	1.00	0755							X																		
CCV	1.00	0801							X																		
CCB	1.00	0807							X																		
CCB	1.00	0840							X																		
PBW	1.00	0854							X																		
LCSW	1.00	0900							X																		
DRB-TP18	1.00	0906							X																		
DRB-TP18MS	1.00	0912							X																		
DRB-TP18MSD	1.00	0918							X																		
RAWTP-RB-02	1.00	0924							X																		
DRB-TP06	1.00	0929							X																		
DRB-TP07	1.00	0935							X																		
RAWTP-25 RB-01	1.00	0941							X																		
RAWTP-RB-03	1.00	0946							X																		
CCV	1.00	0952							X																		
CCB	1.00	0958							X																		

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802216

Instrument ID Number: Cetac M6000 Hg Method: CV Run Number: X0513A

Start Date: 5/13/2008 End Date: 5/13/2008

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.00	0919																X								
S0.2	1.00	0921																X								
S0.5	1.00	0923																X								
S1	1.00	0924																X								
S2	1.00	0926																X								
S5	1.00	0928																X								
S10	1.00	0929																X								
ICV	1.00	0931																X								
ICB	1.00	0933																X								
CCV	1.00	0935																X								
CCB	1.00	0937																X								
PBW	1.00	0938																X								
LCSW	1.00	0940																X								
DRB-TP18	1.00	0941																X								
DRB-TP18D	1.00	0943																X								
DRB-TP18MS	1.00	0945																X								
DRB-TP18MSD	1.00	0946																X								
RAWTP-RB-02	1.00	0948																X								
DRB-TP06	1.00	0950																X								
DRB-TP07	1.00	0951																X								
RAWTP-25 RB-01	1.00	0953																X								
CCV	1.00	0954																X								
CCB	1.00	0956																X								
RAWTP-RB-03	1.00	0958																X								
CCV	1.00	0959																X								
CCB	1.00	1001																X								

Innovative Technical Solutions, Inc.
A Gilbane Company

October 07, 2011

Dr. Casey McKeon
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

RE: ITSI DATA VALIDATION REPORT
RESOLUTION COPPER MINING
HUMAN HEALTH RISK ASSESSMENT
SDG W802216 (RINSE BLANKS)

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) has completed the data review for the rinse blanks associated with Resolution Copper Mining (RCM) for its Human Health Risk Assessment (HHRA) soil samples collected in 2008. ITSI performed data review as described in the U.S. Environmental Protection Agency's (EPA) *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004; and the *Sampling and Analysis Plan (SAP) for Clean Closure at Resolution Copper Mining Limited (Resolution), West Plant Site, Superior Mine* , (Golder, June 2005).

The acronym and abbreviations list is included as Appendix A. Data review qualifiers have been marked in red directly on the analytical reports provided by the laboratory and are attached as Appendix B. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C. Client communications are provided as Appendix D. The ITSI standard legal notice is provided as Appendix E.

1.0 CROSS REFERENCE OF SAMPLES VERIFIED

The analytical data presented in the laboratory Sample Delivery Group (SDG) listed in Table 1 underwent an EPA Level III data validation. The Level III data validation is equivalent to a Step 2A validation, manual (S2AVM) as defined in the *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009). The SDGs contained data for metals by EPA Methods 6010B, 6020 and 7470A.

1501 West Fountainhead Parkway, Suite 350
Tempe, Arizona 85282

(480) 706-6488
fax (480) 704-2952
www.itsi.com

The primary analytical laboratory was SVL of Kellogg, Idaho. Table 1 below provides an analytical summary and cross reference for the samples.

Table 1 Analytical Summary and Cross Reference for Method 6010B

Client Sample ID	Laboratory SDG Number	*Original SDG	Date Sampled	Type
DRB-TP18	W802216-01	W802215	4/29/2008	RB
RAWTP-RB-02	W802216-02	W802215	4/30/2008	RB
DRB-TP06	W802216-03	W802168	5/1/2008	RB
DRB-TP07	W802216-04	W802168	5/1/2008	RB
RAWTP-25 RB-01	W802216-05	W802215	4/29/2008	RB
RAWTP-RB-03	W802216-06	W802215	5/1/2008	RB

*The rinse blanks were originally received with samples from another SDG. All rinse blank samples were compiled into SDG W802216.
RB = Rinse blank

The EPA S2AVM data validation included review of the report from the laboratory equivalent to an abbreviated EPA Level III data deliverable with standardized EPA forms. Level III data deliverables contain the sample results and chain-of-custody forms along with basic Quality Control (QC) summaries including surrogate recoveries, method blank results, and precision and accuracy data summaries for the sample preparation batch. As discussed in Section 2.0 below, the laboratory did not include any comments in the case narrative addressing any QC problems.

2.0 LABORATORY REPORT

The data were reported by the laboratory as an EPA Level III deliverable with standardized EPA forms. The data qualifiers noted by the laboratory in the report were reviewed. Anomalies that required data qualification, if any, are discussed in the sections below. Since the laboratory did not include a case narrative in the report, only the quality control anomalies from the Level III data deliverable could be addressed. Also, there was no official laboratory signature authorizing the release of the report or issue date. ITSI advises that all laboratory reports received by the client contain an official signature authorizing the release of the report and that the issue date should be documented on the report. In addition, the laboratory should provide an officially signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

3.0 SAMPLE INTEGRITY

The Chains-of-Custody (COC) for rinse blank samples were available for review. The rinse blanks were originally received with samples from another SDG, which are indicated in Table 1 of this Data Validation Report (DVR). There were no anomalies that required qualification of the data, however, the following COC anomaly was observed for each SDG.

- The transfer of the samples to the shipping carrier was not documented on the COC. The client indicated that the samplers shipped the samples to SVL via FedEx. ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number. A copy of the communication with the client verifying the transfer of samples to FedEx is provided in Appendix D.

4.0 HOLDING TIME

The samples were analyzed within the recommended method holding time of 180 days for metals and 28 days for mercury.

5.0 INITIAL AND CONTINUING CALIBRATION

The initial and continuing calibrations were not reviewed for this level of validation.

6.0 BLANK EVALUATION

Preparation blanks were analyzed for each analysis. Since this SDG only consisted of rinse blank samples, the results of the rinse blank samples were not compared to the preparation blanks for data qualification. The rinse blanks were evaluated for contamination due to the sampling and handling of the soil samples collected in support of the HHRA. As discussed in the individual DVRs, there were no soil samples qualified due to rinse blank contamination except for SDG W8J0652.

7.0 LABORATORY CONTROL SAMPLE

A laboratory control sample (LCS) was reported for each analysis. QC results were reviewed using the control limits listed in Table C6 of the SAP. There were no LCS anomalies that required qualification of the data.

8.0 MATRIX SPIKE AND MATRIX SPIKE DUPLICATE

The project matrix spike/matrix spike duplicate (MS/MSD) pair was reviewed using the laboratory control limits of 75 to 125 percent for accuracy and 20 relative percent difference (RPD) for precision. The sample used as the MS/MSD pair is identified in Table 1. There were no MS/MSD anomalies that required qualification of the data.

9.0 REPORTING LIMIT SPIKES

Spikes prepared at the laboratory's reporting limit were reviewed. There were no reporting limit spike anomalies that required qualification of the data.

10.0 COMPOUND QUANTITATION AND IDENTIFICATION

The laboratory reporting limits and quantitative results were reviewed. All reporting limits met the Client Required Detection Limits (CRDLs) listed in the SAP. There were no quantitative anomalies except as noted below.

- Sample results with trace concentrations reported below the PQL but above the MDL, have been flagged "J" to indicate an estimated amount.

- There were no units listed on reporting Form 10 for the instrument method detection limits (MDLs) and practical quantitation limits (PQLs) provided with the data package. To provide traceability of laboratory reporting limits from the instrument to the reported data, the laboratory is advised to list the MDL and PQL units on all reporting forms.

11.0 FIELD DUPLICATE SAMPLES

There were no field duplicate samples associated with the rinse blanks.

12.0 RECOMMENDATIONS

ITSI recommends the following actions.

- ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number.

- ITSI advises that all laboratory reports must contain an official signature authorizing the release of the report and that the issue date be documented on the

report. Also, the laboratory should provide a properly signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

- ITSI advises the laboratory to list the MDL and PQL units on all reporting forms to provide traceability of laboratory reporting limits from the instrument to the reported data.

13.0 OVERALL ASSESSMENT FOR RCM HHRA RINSE BLANKS

There were no rejected results for this sampling event. Based on the available information, the data as qualified are considered useable for their intended purposes. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C.

We thank you for the opportunity to serve you and look forward to supporting RCM with data review in the future.

Sincerely,

Innovative Technical Solutions, Inc.

Evelyn Dawson, CHMM

Program Chemist

Enclosures:

Appendix A – List of Acronyms and Abbreviations
Appendix B – Qualified Report Pages
Appendix C – Qualified Results Table
Appendix D – Client Communication
Appendix E – ITSI Standard Legal Notice

cc: John Malusa
Golder Associates, Inc.
4730 North Oracle Road, Suite 210
Tucson, Arizona, 85705

LIST OF ACRONYMS AND ABBREVIATIONS

COC	chain-of-custody
CRDL	Client Required Detection Limits
EPA	U.S. Environmental Protection Agency
FD	field duplicate
HHRA	Human Health Risk Assessment
ITSI	Innovative Technical Solutions, Inc.
LCS	laboratory control spike
MDL	method detection limits
MS/MSD	matrix spike/matrix spike duplicate
PQL	practical quantitation limits
PS	parent sample
QC	quality control
QRT	Qualified Results Table
RPD	relative percent difference
RCM	Resolution Copper Mining
SAP	Sample Analysis Plan
S2AVM	Step 2A validation, manual
SDG	Sample Delivery Group

APPENDIX A

LIST OF ACRONYMS AND ABBREVIATIONS

APPENDIX B

QUALIFIED REPORT PAGES

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802216 **Method Type:**

Sample ID: W802216-01 **Client ID:** DRB-TP18

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Date Received:** 5/7/2008 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-36-0	Antimony	0.32 J	ug/L	J		MS	0.10	PE ICPMS DRC-E	134D
7440-38-2	Arsenic	7.3	ug/L			MS	0.14	PE ICPMS DRC-E	134D
7440-39-3	Barium	1.0 J	ug/L	J		P	0.48	OPTIMA5	W819255
7440-41-7	Beryllium	0.36	ug/L	U		P	0.36	OPTIMA5	W819255
7440-43-9	Cadmium	0.96	ug/L	U		P	0.96	OPTIMA5	W819255A
7440-47-3	Chromium	1.0	ug/L	U		P	1.0	OPTIMA5	W819255
7440-50-8	Copper	77.7	ug/L			P	5.8	OPTIMA5	W819255
7439-92-1	Lead	2.7	ug/L	U		P	2.7	OPTIMA5	W819255
7439-97-6	Mercury	0.064	ug/L	U		CV	0.064	Cetac M6000 Hg	X0513A
7440-02-0	Nickel	2.3	ug/L	U		P	2.3	OPTIMA5	W819255
7782-49-2	Selenium	0.10	ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-28-0	Thallium	0.02	ug/L	U		MS	0.02	PE ICPMS DRC-E	134D

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

PGC ITSI
02Oct2011

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802216 **Method Type:**

Sample ID: W802216-02 **Client ID:** RAWTP-RB-02

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Date Received:** 5/7/2008 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration		Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-36-0	Antimony	0.10		ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-38-2	Arsenic	1.3	J	ug/L	J		MS	0.14	PE ICPMS DRC-E	134D
7440-39-3	Barium	0.48		ug/L	U		P	0.48	OPTIMA5	W819255
7440-41-7	Beryllium	0.36		ug/L	U		P	0.36	OPTIMA5	W819255
7440-43-9	Cadmium	0.96		ug/L	U		P	0.96	OPTIMA5	W819255A
7440-47-3	Chromium	1.0		ug/L	U		P	1.0	OPTIMA5	W819255
7440-50-8	Copper	5.8		ug/L	U		P	5.8	OPTIMA5	W819255
7439-92-1	Lead	2.7		ug/L	U		P	2.7	OPTIMA5	W819255
7439-97-6	Mercury	0.064		ug/L	U		CV	0.064	Cetac M6000 Hg	X0513A
7440-02-0	Nickel	2.3		ug/L	U		P	2.3	OPTIMA5	W819255
7782-49-2	Selenium	0.10		ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-28-0	Thallium	0.02		ug/L	U		MS	0.02	PE ICPMS DRC-E	134D

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

PGC ITSI
02Oct2011

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802216 **Method Type:**

Sample ID: W802216-03 **Client ID:** DRB-TP06

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Date Received:** 5/7/2008 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-36-0	Antimony	0.14 J	ug/L	J		MS	0.10	PE ICPMS DRC-E	134D
7440-38-2	Arsenic	2.0 J	ug/L	J		MS	0.14	PE ICPMS DRC-E	134D
7440-39-3	Barium	0.48	ug/L	U		P	0.48	OPTIMA5	W819255
7440-41-7	Beryllium	0.36	ug/L	U		P	0.36	OPTIMA5	W819255
7440-43-9	Cadmium	0.96	ug/L	U		P	0.96	OPTIMA5	W819255A
7440-47-3	Chromium	1.0	ug/L	U		P	1.0	OPTIMA5	W819255
7440-50-8	Copper	12.9	ug/L			P	5.8	OPTIMA5	W819255
7439-92-1	Lead	2.7	ug/L	U		P	2.7	OPTIMA5	W819255
7439-97-6	Mercury	0.064	ug/L	U		CV	0.064	Cetac M6000 Hg	X0513A
7440-02-0	Nickel	2.3	ug/L	U		P	2.3	OPTIMA5	W819255
7782-49-2	Selenium	0.10	ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-28-0	Thallium	0.02	ug/L	U		MS	0.02	PE ICPMS DRC-E	134D

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

PGC ITSI
02Oct2011

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802216 **Method Type:**

Sample ID: W802216-04 **Client ID:** DRB-TP07

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Date Received:** 5/7/2008 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-36-0	Antimony	0.10	ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-38-2	Arsenic	1.4 J	ug/L	J		MS	0.14	PE ICPMS DRC-E	134D
7440-39-3	Barium	0.54 J	ug/L	J		P	0.48	OPTIMA5	W819255
7440-41-7	Beryllium	0.36	ug/L	U		P	0.36	OPTIMA5	W819255
7440-43-9	Cadmium	0.96	ug/L	U		P	0.96	OPTIMA5	W819255A
7440-47-3	Chromium	1.0	ug/L	U		P	1.0	OPTIMA5	W819255
7440-50-8	Copper	5.8	ug/L	U		P	5.8	OPTIMA5	W819255
7439-92-1	Lead	2.7	ug/L	U		P	2.7	OPTIMA5	W819255
7439-97-6	Mercury	0.064	ug/L	U		CV	0.064	Cetac M6000 Hg	X0513A
7440-02-0	Nickel	2.3	ug/L	U		P	2.3	OPTIMA5	W819255
7782-49-2	Selenium	0.10	ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-28-0	Thallium	0.02	ug/L	U		MS	0.02	PE ICPMS DRC-E	134D

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

PGC ITSI
02Oct2011

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802216 **Method Type:**

Sample ID: W802216-05 **Client ID:** RAWTP-25 RB-01

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Date Received:** 5/7/2008 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration		Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-36-0	Antimony	0.10		ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-38-2	Arsenic	0.86	J	ug/L	J		MS	0.14	PE ICPMS DRC-E	134D
7440-39-3	Barium	0.48		ug/L	U		P	0.48	OPTIMA5	W819255
7440-41-7	Beryllium	0.36		ug/L	U		P	0.36	OPTIMA5	W819255
7440-43-9	Cadmium	0.96		ug/L	U		P	0.96	OPTIMA5	W819255A
7440-47-3	Chromium	1.0		ug/L	U		P	1.0	OPTIMA5	W819255
7440-50-8	Copper	5.8		ug/L	U		P	5.8	OPTIMA5	W819255
7439-92-1	Lead	2.7		ug/L	U		P	2.7	OPTIMA5	W819255
7439-97-6	Mercury	0.064		ug/L	U		CV	0.064	Cetac M6000 Hg	X0513A
7440-02-0	Nickel	2.3		ug/L	U		P	2.3	OPTIMA5	W819255
7782-49-2	Selenium	0.10		ug/L	U		MS	0.10	PE ICPMS DRC-E	134D
7440-28-0	Thallium	0.02		ug/L	U		MS	0.02	PE ICPMS DRC-E	134D

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

PGC ITSI
02Oct2011

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802216 **Method Type:**

Sample ID: W802216-06 **Client ID:** RAWTP-RB-03

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Date Received:** 5/7/2008 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration		Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-36-0	Antimony	0.13	J	ug/L	J		MS	0.10	PE ICPMS DRC-E	134D
7440-38-2	Arsenic	1.1	J	ug/L	J		MS	0.14	PE ICPMS DRC-E	134D
7440-39-3	Barium	0.48		ug/L	U		P	0.48	OPTIMA5	W819255
7440-41-7	Beryllium	0.36		ug/L	U		P	0.36	OPTIMA5	W819255
7440-43-9	Cadmium	0.96		ug/L	U		P	0.96	OPTIMA5	W819255A
7440-47-3	Chromium	1.0		ug/L	U		P	1.0	OPTIMA5	W819255
7440-50-8	Copper	5.8		ug/L	U		P	5.8	OPTIMA5	W819255
7439-92-1	Lead	2.7		ug/L	U		P	2.7	OPTIMA5	W819255
7439-97-6	Mercury	0.064		ug/L	U		CV	0.064	Cetac M6000 Hg	X0513A
7440-02-0	Nickel	2.3		ug/L	U		P	2.3	OPTIMA5	W819255
7782-49-2	Selenium	0.11	J	ug/L	J		MS	0.10	PE ICPMS DRC-E	134D
7440-28-0	Thallium	0.02		ug/L	U		MS	0.02	PE ICPMS DRC-E	134D

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

PGC ITSI
02Oct2011

APPENDIX C

QUALIFIED RESULTS TABLE

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Parameter	Original Value	Added Qualifier	New Value	PQL	MDL	Units	Reason	Validator
W802216-01	DRB-TP18	4/29/2008	RB	6010B	Barium	1.0	J	1.0 J	2	0.48	ug/L	Trace	PGC/EHD
W802216-01	DRB-TP18	4/29/2008	RB	6020	Antimony	0.32	J	0.32 J	1.2	0.1	ug/L	Trace	PGC/EHD
W802216-02	RAWTP-RB-02	4/30/2008	RB	6020	Arsenic	1.3	J	1.3 J	3	0.14	ug/L	Trace	PGC/EHD
W802216-03	DRB-TP06	5/1/2008	RB	6020	Antimony	0.14	J	0.14 J	1.2	0.1	ug/L	Trace	PGC/EHD
W802216-03	DRB-TP06	5/1/2008	RB	6020	Arsenic	2.0	J	2.0 J	3	0.14	ug/L	Trace	PGC/EHD
W802216-04	DRB-TP07	5/1/2008	RB	6010B	Barium	0.54	J	0.54 J	2	0.48	ug/L	Trace	PGC/EHD
W802216-04	DRB-TP07	5/1/2008	RB	6020	Arsenic	1.4	J	1.4 J	3	0.14	ug/L	Trace	PGC/EHD
W802216-05	RAWTP-25 RB-01	4/29/2008	RB	6020	Arsenic	0.86	J	0.86 J	3	0.14	ug/L	Trace	PGC/EHD
W802216-06	RAWTP-RB-03	5/1/2008	RB	6020	Selenium	0.11	J	0.11 J	3	0.1	ug/L	Trace	PGC/EHD
W802216-06	RAWTP-RB-03	5/1/2008	RB	6020	Antimony	0.13	J	0.13 J	1.2	0.1	ug/L	Trace	PGC/EHD
W802216-06	RAWTP-RB-03	5/1/2008	RB	6020	Arsenic	1.1	J	1.1 J	3	0.14	ug/L	Trace	PGC/EHD

Notes

J = estimated value
µg/L = micrograms per liter

MDL = method detection limit
PQL = Practical Quantitation Limit
RB = rinse blank
trace = result reported between MDL and RL

APPENDIX D

CLIENT COMMUNICATION

Peggy Cota

From: Morfin, Orestes <Orestes_Morfin@golder.com>
Sent: Tuesday, September 27, 2011 1:52 PM
To: Peggy Cota; Evelyn Dawson
Cc: Malusa, John
Subject: 2008 RAWTP sample shipping

Hello Peggy and Evelyn,
I received an e-mail today from Alejandra Bonilla, one of the two field crew who collected the 2008 RAWTP samples. She confirmed that the samples were shipped to SVL via FedEx.
I hope that helps.
Sincerely,
Orestes

Orestes Morfín (M.Sc.)| Project Hydrogeochemist | **Golder Associates Ltd.**
102, 2535 - 3rd Avenue S.E., Calgary, Alberta, Canada T2A 7W5
T: +1 (403) 299 5600 | **D:** +1 403 513-3574 | **F:** +1 (403) 299-5606 | **C:** +1 | **E:** Orestes_Morfin@golder.com | **www.golder.com**

Work Safe, Home Safe

APPENDIX E

ITSI STANDARD LEGAL NOTICE

ITSI STANDARD LEGAL NOTICE

ITSI is issuing this report at the request of the Client and based upon information furnished by Client. Further, the presence of environmental contamination can be influenced by many factors, including unknown and changing underground conditions. Therefore: 1. This report may not be relied upon by anyone for financial decision-making. 2. No one other than Client is authorized to use this report for any purpose. 3. Any conclusions or opinions included in this report are subject to reasonable revision based upon any new environmental or other data which is later developed. 4. Any results or conclusions stated are to be considered limited by the quality of the underlying sample or other data on which they are based, the budget established by the Client or otherwise for gathering and analyzing data, and by any assumptions and qualifications contained within this report.

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W802228 **Method Type:** **SOW No.:** SW846

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W802228-01	RAWTP-29 2"-1'	
W802228-02	RAWTP-29 1'-2'	
W802228-03	RAWTP-29 2'-3'	
W802228-04	RAWTP-30 2"-1'	
W802228-05	RAWTP-30 1'-2'	
W802228-06	RAWTP-14 0-2"	
W821093-MS1	RAWTP-29 2"-1'MS	Matrix Spike
W821093-MSD1	RAWTP-29 2"-1'MSD	Matrix Spike Duplicate

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: HHRA RESOLUTION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **KIRBY L. GRAY**

Date: Title: **TECHNICAL DIRECTOR**

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802228 **Method Type:**

Sample ID: W802228-06 **Client ID:** RAWTP-14 0-2"

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/9/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	484	mg/Kg			P	0.71	OPTIMA1	W821093
7440-50-8	Copper	15400	mg/Kg		D	P	2.9	OPTIMA1	W821093A
7439-92-1	Lead	284	mg/Kg			P	0.23	OPTIMA1	W821093

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802228 **Method Type:**

Sample ID: W802228-02 **Client ID:** RAWTP-29 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/9/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	98.2	mg/Kg			P	0.71	OPTIMA1	W821093
7440-50-8	Copper	550	mg/Kg			P	0.29	OPTIMA1	W821093
7439-92-1	Lead	39.9	mg/Kg			P	0.23	OPTIMA1	W821093

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802228 **Method Type:**

Sample ID: W802228-01 **Client ID:** RAWTP-29 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/9/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	139	mg/Kg			P	0.71	OPTIMA1	W821093
7440-50-8	Copper	1150	mg/Kg			P	0.29	OPTIMA1	W821093
7439-92-1	Lead	65.7	mg/Kg			P	0.23	OPTIMA1	W821093

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802228 **Method Type:**

Sample ID: W802228-03 **Client ID:** RAWTP-29 2'-3'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/9/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	9.7	mg/Kg			P	0.71	OPTIMA1	W821093
7440-50-8	Copper	49.8	mg/Kg			P	0.29	OPTIMA1	W821093
7439-92-1	Lead	15.6	mg/Kg			P	0.23	OPTIMA1	W821093

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802228 **Method Type:**

Sample ID: W802228-05 **Client ID:** RAWTP-30 1'-2'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/9/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	23.0	mg/Kg			P	0.71	OPTIMA1	W821093
7440-50-8	Copper	87.6	mg/Kg			P	0.29	OPTIMA1	W821093
7439-92-1	Lead	16.9	mg/Kg			P	0.23	OPTIMA1	W821093

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W802228 **Method Type:**

Sample ID: W802228-04 **Client ID:** RAWTP-30 2"-1'

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 5/9/2008 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	53.9	mg/Kg			P	0.71	OPTIMA1	W821093
7440-50-8	Copper	887	mg/Kg			P	0.29	OPTIMA1	W821093
7439-92-1	Lead	60.3	mg/Kg			P	0.23	OPTIMA1	W821093

Color Before: BROWN **Clarity Before:** **Texture:** MEDIUM

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments:

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV					**Source:** 08E0153				
	Arsenic	2018.38	2000.0	101	90.0 - 110.0	P	5/23/2008	09:40	W821093
	Copper	1975.19	2000.0	99	90.0 - 110.0	P	5/23/2008	09:40	W821093
	Lead	1953.63	2000.0	98	90.0 - 110.0	P	5/23/2008	09:40	W821093
CCV					**Source:** 08E0153				
	Arsenic	2038.62	2000.0	102	90.0 - 110.0	P	5/23/2008	10:10	W821093
	Copper	1965.87	2000.0	98	90.0 - 110.0	P	5/23/2008	10:10	W821093
	Lead	1961.08	2000.0	98	90.0 - 110.0	P	5/23/2008	10:10	W821093
CCV					**Source:** 08E0153				
	Arsenic	1943.61	2000.0	97	90.0 - 110.0	P	5/23/2008	10:33	W821093
	Copper	1925.50	2000.0	96	90.0 - 110.0	P	5/23/2008	10:33	W821093
	Lead	1888.20	2000.0	94	90.0 - 110.0	P	5/23/2008	10:33	W821093
CCV					**Source:** 08E0153				
	Arsenic	1968.25	2000.0	98	90.0 - 110.0	P	5/23/2008	11:37	W821093
	Copper	1919.41	2000.0	96	90.0 - 110.0	P	5/23/2008	11:37	W821093
	Lead	1911.50	2000.0	96	90.0 - 110.0	P	5/23/2008	11:37	W821093
CCV					**Source:** 08E0153				
	Arsenic	1945.67	2000.0	97	90.0 - 110.0	P	5/23/2008	12:56	W821093
	Copper	1921.19	2000.0	96	90.0 - 110.0	P	5/23/2008	12:56	W821093
	Lead	1906.24	2000.0	95	90.0 - 110.0	P	5/23/2008	12:56	W821093
ICV					**Source:** 08E0153				
	Copper	2075.48	2000.0	104	90.0 - 110.0	P	6/3/2008	09:59	W821093A
CCV					**Source:** 08E0153				
	Copper	2186.18	2000.0	109	90.0 - 110.0	P	6/3/2008	10:27	W821093A
CCV					**Source:** 08E0153				
	Copper	2144.47	2000.0	107	90.0 - 110.0	P	6/3/2008	10:35	W821093A
CCV					**Source:** 08E0153				
	Copper	2062.34	2000.0	103	90.0 - 110.0	P	6/3/2008	10:56	W821093A

- 2b -
CRDL STANDARD FOR AA & ICP

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No:** **SAS No.:**

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Advisory Limits (%R)	M	Analysis Date	Analysis Time	Run Number
CRI					**Source:** 08E0089				
	Arsenic	28.24	25.0	113	50 - 150	P	5/23/2008	09:52	W821093
	Copper	8.21	10.0	82	50 - 150	P	5/23/2008	09:52	W821093
	Lead	4.14	7.5	55	50 - 150	P	5/23/2008	09:52	W821093
CRI					**Source:** 08E0089				
	Copper	8.29	10.0	83	50 - 150	P	6/3/2008	10:10	W821093A

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/23/2008	09:46	W821093
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/23/2008	09:46	W821093
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/23/2008	09:46	W821093
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/23/2008	10:15	W821093
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/23/2008	10:15	W821093
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/23/2008	10:15	W821093
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/23/2008	10:38	W821093
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/23/2008	10:38	W821093
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/23/2008	10:38	W821093
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/23/2008	11:43	W821093
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/23/2008	11:43	W821093
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/23/2008	11:43	W821093
CCB										
	Arsenic	8.800	+/-25.000	U	8.800	25.000	P	5/23/2008	13:02	W821093
	Copper	5.800	+/-10.000	U	5.800	10.000	P	5/23/2008	13:02	W821093
	Lead	2.700	+/-7.500	U	2.700	7.500	P	5/23/2008	13:02	W821093
ICB										
	Copper	5.800	+/-10.000	U	5.800	10.000	P	6/3/2008	10:04	W821093A
CCB										
	Copper	5.800	+/-10.000	U	5.800	10.000	P	6/3/2008	10:41	W821093A
CCB										
	Copper	5.800	+/-10.000	U	5.800	10.000	P	6/3/2008	11:01	W821093A

- 3b -
PREPARATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result (mg/Kg)	Conc Qual	Q	Acceptance Limit	MDL	PQL	M	Analysis Date	Analysis Time	Run
PBS			**SOIL**								
	Arsenic	0.710U			+/-0.710	0.710	2.500	P	5/23/2008	11:55	W821093
	Copper	0.290U			+/-0.290	0.290	1.000	P	5/23/2008	11:55	W821093
	Lead	0.230U			+/-0.230	0.230	0.750	P	5/23/2008	11:55	W821093

- 4 -

INTERFERENCE CHECK SAMPLE

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA1

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window	Analysis Date	Analysis Time	Run Number
ICSA					**Source:** 08E0109/08E0110			
	Arsenic	-0.060				5/23/2008	09:58	W821093
	Copper	10800	10000	108	80 - 120%	5/23/2008	09:58	W821093
	Lead	-2.6				5/23/2008	09:58	W821093
ICSAB					**Source:** 08E0109/08E0110			
	Arsenic	497	500	99	80 - 120%	5/23/2008	10:04	W821093
	Copper	531	500	106	80 - 120%	5/23/2008	10:04	W821093
	Lead	472	500	94	80 - 120%	5/23/2008	10:04	W821093
ICSA					**Source:** 08E0109/08E0110			
	Copper	11800	10000	118	80 - 120%	6/3/2008	10:16	W821093A
ICSAB					**Source:** 08E0109/08E0110			
	Copper	577	500	115	80 - 120%	6/3/2008	10:21	W821093A

- 5a -

MATRIX SPIKE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802228-01 **Client ID:** RAWTP-29 2"-1'MS

Percent Solids for Sample: 100.00 **Spiked ID:** W821093-MS1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	245.1560		138.7771		100.00	106		P
Copper	mg/Kg	75 - 125	1461.0080		1154.7450		100.00	306		P
Lead	mg/Kg	75 - 125	164.8623		65.6663		100.00	99		P

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W802228-01 **Client ID:** RAWTP-29 2"-1'MSD

Percent Solids for Sample: 100.00 **Spiked ID:** W821093-MSD1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	243.2594		138.7771		100.00	104		P
Copper	mg/Kg	75 - 125	1464.5470		1154.7450		100.00	310		P
Lead	mg/Kg	75 - 125	164.5905		65.6663		100.00	99		P

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W821093-MS1 **Client ID:** RAWTP-29 2"-1'MSD

Percent Solids for Sample: 100.00 **Duplicate ID:** W821093-MSD1 **Percent Solids for Duplicate:** 100.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	mg/Kg		245.1560		243.2594		1		P
Copper	mg/Kg		1461.0080		1464.5470		0		P
Lead	mg/Kg		164.8623		164.5905		0		P

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSS			**LCS Source:**	**QC19115SCSN**			**Batch Number:**	**3050B-05212**
	Arsenic	mg/Kg	100.0	91.0		91	80.0 - 120.0	P
	Copper	mg/Kg	100.0	99.8		100	80.0 - 120.0	P
	Lead	mg/Kg	100.0	91.8		92	80.0 - 120.0	P

- 10 -
METHOD DETECTION LIMITS

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Analyte	Wave- length (nm)	MDL	PQL
OPTIMA1			**Date:** 5/21/2008
OPT1 GOLDER			
Arsenic Soil	188.979	7.1	25
Copper Soil	324.752	2.9	10
Lead Soil	220.353	2.3	7.5
Arsenic Water	188.979	8.8	25
Copper Water	324.752	5.8	10
Lead Water	220.353	3.9	7.5

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA1 **Date:** 4/1/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	As
Aluminum	308.22	0.0000000	0.0131100	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.1071000	0.0000000	-0.0606000	0.0000000	0.0000000
Arsenic	188.98	0.1485000	0.0391000	0.0089000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0240000	0.0010100	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0037000	0.0000000	0.0000000
Cadmium	226.50	-0.0073400	0.0000000	0.1533000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0057000	-0.0191000	0.0000000
Cobalt	228.62	0.0052000	0.0000000	0.0146700	0.0000000	0.0000000
Copper	324.75	0.0078000	0.0000000	-0.0746000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	-0.0309000	0.0000000
Lead	220.35	0.0325000	0.0031000	0.2458000	0.0186000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.2096000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0262000	0.0184000	0.0000000
Nickel	232.00	-0.0011000	0.0116000	-1.5848000	0.0207000	0.1015000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.1266000	0.0218000	-0.1183000	0.0304000	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0953000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0084000	0.0272000	-0.0155000	-0.0538000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0360000	0.0011560	0.0000000
Zinc	206.20	0.0039000	0.0000000	0.0000000	0.0340920	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA1 **Date:** 4/1/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Ba	Be	Cd	Co	Cr
Aluminum	308.22	0.6131000	0.0000000	0.0000000	-6.0100002	-0.0110000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	7.6824999
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	-0.0874000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.1931000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	-0.0285000	0.0861000
Calcium	315.89	0.0000000	0.0000000	0.0000000	1.8019000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.2623000	0.0000000	-0.1962000	-0.1072000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	-1.3487000	0.6500000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.4909000	-0.1548000
Nickel	232.00	0.0000000	-0.3557000	0.0000000	0.0096000	33.8223991
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	1.8843000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	3.4152999	0.5573000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	-1.5342000
Zinc	206.20	0.0000000	-0.0327000	0.3972000	0.0000000	-0.5552000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA1 **Date:** 4/1/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Cu	K	Mn	Mo	Ni
Aluminum	308.22	0.0000000	0.0000000	0.0000000	5.7308002	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.4777000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0081900	-0.3819000	0.0050000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0220600	0.0000000	-0.0048000	-0.0345000	-0.5721900
Calcium	315.89	0.0000000	0.0000000	0.0000000	1.4406700	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0330000	-0.1309000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.1714390
Copper	324.75	0.0000000	0.0000000	0.0000000	0.7193000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.8628000	0.0000000	0.2609600	-0.7003500	0.0335000
Magnesium	279.08	0.0000000	0.0028000	-5.3892002	-6.2502999	0.1948000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0329000	0.0000000
Nickel	232.00	-0.4576000	0.0000000	-3.1677001	4.2866001	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.9083000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.2081400	0.0987000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	-9.5826998	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	-0.0639000	-6.8871999	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.1280000	0.6149000	-0.2085000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA1 **Date:** 4/1/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: P	Sb	Se	Si	Sn
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	1.1009001
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	-2.0701001
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0344000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0144000	-0.1669400	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	-0.1009000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.1645000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.1446000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.6663000	0.1814000	0.1363000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA1 **Date:** 4/1/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Ti	U	V	Zn	La
Aluminum	308.22	1.4739000	-6.5716400	12.6000996	0.0000000	
Antimony	206.84	0.0000000	-1.0741000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	-1.8369000	0.0000000	0.0000000	0.0000000	29.4022999
Barium	233.53	0.0000000	-0.1777000	-1.2400000	0.0033000	0.0000000
Beryllium	313.11	0.0825000	-0.3040000	0.0664000	0.0000000	0.0000000
Cadmium	226.50	0.0606770	-0.1451000	0.0000000	0.0000000	-0.1140000
Calcium	315.89	0.0000000	5.3004999	-1.6645000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.6494000	0.3242000	0.0000000	0.0000000
Cobalt	228.62	1.8609999	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.2501000	0.8966000	0.0000000	0.0000000	-0.0474000
Iron	273.96	0.0000000	-1.7112000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.7484000	0.0000000	-0.0112000	0.1145000
Magnesium	279.08	-1.2385000	5.7515998	-0.1741000	0.0000000	0.0000000
Manganese	260.57	0.0000000	-0.1178000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.7481000	0.3127000	0.0000000	-0.5781000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	-2.3810999	0.0000000	0.0000000	-1.2065500
Silver	328.07	0.0000000	0.7301860	-0.0570000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	-0.7083000	0.1363600	2.4705000	0.0000000	0.0000000
Vanadium	292.40	0.5177000	-1.0334001	0.0000000	0.0000000	0.2382700
Zinc	206.20	0.0000000	0.0000000	-0.0877000	0.0000000	0.0000000

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA1 **Date:** 4/21/2008

Analyte	Integration Time (sec)	LDR ug/L	
Arsenic	20.00	20000	OPT1 GOLDER
Copper	20.00	60000	OPT1 GOLDER
Lead	20.00	100000	OPT1 GOLDER

- 13 -
SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W802228

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number: 3050B-05212008	**Method:** P						
PBS	PBS	MB	SOIL	5/21/08	1.00	100.0	100.00
LCSS	LCSS	LCS	SOIL	5/21/08	1.00	100.0	100.00
W802228-01	RAWTP-29 2"-1'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W821093-MS1	RAWTP-29 2"-1'MS	MS	SOIL	5/21/08	1.00	100.0	100.00
W821093-MSD1	RAWTP-29 2"-1'MSD	MSD	SOIL	5/21/08	1.00	100.0	100.00
W802228-02	RAWTP-29 1'-2'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802228-03	RAWTP-29 2'-3'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802228-04	RAWTP-30 2"-1'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802228-05	RAWTP-30 1'-2'	SAM	SOIL	5/21/08	1.00	100.0	100.00
W802228-06	RAWTP-14 0-2"	SAM	SOIL	5/21/08	1.00	100.0	100.00

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802228

Instrument ID Number: OPTIMA1 Method: P Run Number: W821093

Start Date: 5/23/2008 End Date: 5/23/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CALIB BLANK 1	1.00	0912				X							X		X											
STD1	1.00	0918				X							X		X											
STD2	1.00	0924																								
STD3	1.00	0928																								
STD4	1.00	0932																								
STD5	1.00	0936																								
ICV	1.00	0940				X							X		X											
ICB	1.00	0946				X							X		X											
CRI	1.00	0952				X							X		X											
ICSA	1.00	0958				X							X		X											
ICSAB	1.00	1004				X							X		X											
CCV	1.00	1010				X							X		X											
CCB	1.00	1015				X							X		X											
ZZZZZZ	1.00	1026																								
CCV	1.00	1033				X							X		X											
CCB	1.00	1038				X							X		X											
ZZZZZZ	1.00	1101																								
ZZZZZZ	1.00	1107																								
ZZZZZZ	1.00	1113																								
ZZZZZZ	1.00	1119																								
ZZZZZZ	1.00	1125																								
ZZZZZZ	1.00	1131																								
CCV	1.00	1137				X							X		X											
CCB	1.00	1143				X							X		X											
PBS	1.00	1155				X							X		X											
LCSS	1.00	1201				X							X		X											
RAWTP-29 2"-1'	1.00	1207				X							X		X											
RAWTP-29 2"-1'MS	1.00	1213				X							X		X											
RAWTP-29 2"-1'MSD	1.00	1220				X							X		X											
RAWTP-29 1'-2'	1.00	1226				X							X		X											
RAWTP-29 2'-3'	1.00	1232				X							X		X											
RAWTP-30 2"-1'	1.00	1238				X							X		X											
RAWTP-30 1'-2'	1.00	1244				X							X		X											
RAWTP-14 0-2"	1.00	1250				X									X											
CCV	1.00	1256				X							X		X											
CCB	1.00	1302				X							X		X											

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W802228

Instrument ID Number: OPTIMA1 Method: P Run Number: W821093A

Start Date: 6/3/2008 End Date: 6/3/2008

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CALIB BLANK 1	1.00	0930											X														
STD1	1.00	0936											X														
STD2	1.00	0942																									
STD3	1.00	0947																									
STD4	1.00	0951																									
STD5	1.00	0955																									
ICV	1.00	0959											X														
ICB	1.00	1004											X														
CRI	1.00	1010											X														
ICSA	1.00	1016											X														
ICSAB	1.00	1021											X														
CCV	1.00	1027											X														
CCV	1.00	1035											X														
CCB	1.00	1041											X														
RAWTP-14 0-2"	10.00	1050											X														
CCV	1.00	1056											X														
CCB	1.00	1101											X														

Innovative Technical Solutions, Inc.
A Gilbane Company

October 07, 2011

Dr. Casey McKeon
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

RE: ITSI DATA VALIDATION REPORT
RESOLUTION COPPER MINING
HUMAN HEALTH RISK ASSESSMENT
SDG W802228

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) has completed the data review for Resolution Copper Mining (RCM) for its Human Health Risk Assessment (HHRA) soil samples collected in 2008. ITSI performed data review as described in the U.S. Environmental Protection Agency's (EPA) *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004; and the *Sampling and Analysis Plan (SAP) for Clean Closure at Resolution Copper Mining Limited (Resolution), West Plant Site, Superior Mine* , (Golder, June 2005).

The acronym and abbreviations list is included as Appendix A. Client communications are provided as Appendix B. The ITSI standard legal notice is provided as Appendix C.

1.0 CROSS REFERENCE OF SAMPLES VERIFIED

The analytical data presented in the laboratory Sample Delivery Group (SDG) listed in Table 1 underwent an EPA Level III data validation. The Level III data validation is equivalent to a Step 2A validation, manual (S2AVM) as defined in the *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009). The SDGs contained data for arsenic, copper and lead by EPA Method 6010B. The primary analytical laboratory was SVL of Kellogg, Idaho. Table 1 below provides an analytical summary and cross reference for the samples.

1501 West Fountainhead Parkway, Suite 350
Tempe, Arizona 85282

(480) 706-6488
fax (480) 704-2952
www.itsi.com

Table 1 Analytical Summary and Cross Reference for Method 6010B

Client Sample ID	Laboratory SDG Number	Date Sampled	QC Samples
RAWTP-29 2"-1'	W802228-01	4/28/2008	MS/MSD
RAWTP-29 1'-2'	W802228-02	4/28/2008	
RAWTP-29 2'-3'	W802228-03	4/28/2008	
RAWTP-30 2"-1'	W802228-04	4/28/2008	
RAWTP-30 1'-2'	W802228-05	4/28/2008	
RAWTP-14 0-2"	W802228-06	4/29/2008	

MS/MSD = Matrix spike/matrix spike duplicate

The EPA S2AVM data validation included review of the report from the laboratory equivalent to an abbreviated EPA Level III data deliverable with standardized EPA forms. Level III data deliverables contain the sample results and chain-of-custody forms along with basic Quality Control (QC) summaries including surrogate recoveries, method blank results, and precision and accuracy data summaries for the sample preparation batch. As discussed in Section 2.0 below, the laboratory did not include any comments in the case narrative addressing any QC problems.

2.0 LABORATORY REPORT

The data were reported by the laboratory as an EPA Level III deliverable with standardized EPA forms. The data qualifiers noted by the laboratory in the report were reviewed. Anomalies that required data qualification, if any, are discussed in the sections below. Since the laboratory did not include a case narrative in the report, only the quality control anomalies from the Level III data deliverable could be addressed. Also, there was no official laboratory signature authorizing the release of the report or issue date. ITSI advises that all laboratory reports received by the client contain an official signature authorizing the release of the report and that the issue date should be documented on the report. In addition, the laboratory should provide an officially signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

3.0 SAMPLE INTEGRITY

The Chains-of-Custody (COC) for the April 28 and April 29, 2008 sampling event were available for review. There were no anomalies that required qualification of the data, however, the following COC anomaly was observed.

- The transfer of the samples to the shipping carrier was not documented on the COC. The client indicated that the samplers shipped the samples to SVL via FedEx. ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number. A copy of the communication with the client verifying the transfer of samples to FedEx is provided in Appendix B.

4.0 HOLDING TIME

The samples were analyzed within the recommended method holding time of 180 days after collection.

5.0 INITIAL AND CONTINUING CALIBRATION

The initial and continuing calibrations were not reviewed for this level of validation.

6.0 BLANK EVALUATION

Preparation and equipment blanks were reviewed. The equipment blank(s) associated with the samples are listed in the Data Validation Report (DVR) for SDG W802216. There were no compounds detected in any of the blanks that required qualification of the data.

7.0 LABORATORY CONTROL SAMPLE

A laboratory control sample (LCS) was reported for each analysis. QC results were reviewed using the control limits listed in Table C6 of the SAP. There were no LCS anomalies that required qualification of the data.

8.0 MATRIX SPIKE AND MATRIX SPIKE DUPLICATE

The project matrix spike/matrix spike duplicate (MS/MSD) pair was reviewed using the laboratory control limits of 75 to 125 percent for accuracy and 20 relative percent difference (RPD) for precision. The sample used as the MS/MSD pair is identified in Table 1. There were no MS/MSD anomalies that required qualification of the data.

9.0 REPORTING LIMIT SPIKES

Spikes prepared at the laboratory's reporting limit were reviewed. There were no reporting limit spike anomalies that required qualification of the data.

10.0 COMPOUND QUANTITATION AND IDENTIFICATION

The laboratory reporting limits and quantitative results were reviewed. All reporting limits met the Client Required Detection Limits (CRDLs) listed in the SAP. There were no quantitative anomalies that required qualification of the data, however, the following observation was made.

- There were no units listed on reporting Form 10 for the instrument method detection limits (MDLs) and practical quantitation limits (PQLs) provided with the data package. To provide traceability of laboratory reporting limits from the instrument to the reported data, the laboratory is advised to list the MDL and PQL units on all reporting forms.

11.0 FIELD DUPLICATE SAMPLES

There were no field duplicate samples identified in this SDG.

12.0 RECOMMENDATIONS

ITSI recommends the following actions.

- ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number.

- ITSI advises that all laboratory reports must contain an official signature authorizing the release of the report and that the issue date be documented on the report. Also, the laboratory should provide a properly signed report for the data in this SDG indicating the original and revised issue dates that attest to the validity of the data.

- ITSI advises the laboratory to list the MDL and PQL units on all reporting forms to provide traceability of laboratory reporting limits from the instrument to the reported data.

13.0 OVERALL ASSESSMENT FOR RCM HHRA APRIL 28 AND APRIL 29, 2011 SAMPLING EVENT

There were no qualified results for this sampling event. Based on the available information, the data are considered useable for their intended purposes.

We thank you for the opportunity to serve you and look forward to supporting RCM with data review in the future.

Sincerely,

Innovative Technical Solutions, Inc.

Evelyn Dawson, CHMM

Program Chemist

Enclosures:

Appendix A – List of Acronyms and Abbreviations
Appendix B – Client Communication
Appendix C – ITSI Standard Legal Notice

cc: John Malusa
Golder Associates, Inc.
4730 North Oracle Road, Suite 210
Tucson, Arizona, 85705

APPENDIX A

LIST OF ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS AND ABBREVIATIONS

COC	chain-of-custody
CRDL	Client Required Detection Limits
EPA	U.S. Environmental Protection Agency
FD	field duplicate
HHRA	Human Health Risk Assessment
ITSI	Innovative Technical Solutions, Inc.
LCS	laboratory control spike
MDL	method detection limits
MS/MSD	matrix spike/matrix spike duplicate
PQL	practical quantitation limits
PS	parent sample
QC	quality control
QRT	Qualified Results Table
RPD	relative percent difference
RCM	Resolution Copper Mining
SAP	Sample Analysis Plan
S2AVM	Step 2A validation, manual
SDG	Sample Delivery Group

APPENDIX B

CLIENT COMMUNICATION

Peggy Cota

From: Morfin, Orestes <Orestes_Morfin@golder.com>
Sent: Tuesday, September 27, 2011 1:52 PM
To: Peggy Cota; Evelyn Dawson
Cc: Malusa, John
Subject: 2008 RAWTP sample shipping

Hello Peggy and Evelyn,
I received an e-mail today from Alejandra Bonilla, one of the two field crew who collected the 2008 RAWTP samples. She confirmed that the samples were shipped to SVL via FedEx.
I hope that helps.
Sincerely,
Orestes

Orestes Morfín (M.Sc.)| Project Hydrogeochemist | **Golder Associates Ltd.**
102, 2535 - 3rd Avenue S.E., Calgary, Alberta, Canada T2A 7W5
T: +1 (403) 299 5600 | **D:** +1 403 513-3574 | **F:** +1 (403) 299-5606 | **C:** +1 | **E:** Orestes_Morfin@golder.com | **www.golder.com**

Work Safe, Home Safe

APPENDIX C

ITSI STANDARD LEGAL NOTICE

ITSI STANDARD LEGAL NOTICE

ITSI is issuing this report at the request of the Client and based upon information furnished by Client. Further, the presence of environmental contamination can be influenced by many factors, including unknown and changing underground conditions. Therefore: 1. This report may not be relied upon by anyone for financial decision-making. 2. No one other than Client is authorized to use this report for any purpose. 3. Any conclusions or opinions included in this report are subject to reasonable revision based upon any new environmental or other data which is later developed. 4. Any results or conclusions stated are to be considered limited by the quality of the underlying sample or other data on which they are based, the budget established by the Client or otherwise for gathering and analyzing data, and by any assumptions and qualifications contained within this report.

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
RAWTP-03 2"-1'	W8J0652-01	Solid	30-Apr-08 08:35	27-Oct-2008
RAWTP-24 0-2"	W8J0652-02	Solid	29-Apr-08 08:50	27-Oct-2008
RAWTP-20 0-2"	W8J0652-03	Solid	01-May-08 13:05	27-Oct-2008
RAWTP-09 2"-1	W8J0652-04	Solid	30-Apr-08 13:40	27-Oct-2008
RAWTP-18 0-2"	W8J0652-05	Solid	29-Apr-08 09:45	27-Oct-2008
RAWTP-12 0-2"	W8J0652-06	Solid	28-Apr-08 15:25	27-Oct-2008
RAWTP-04 0-2"	W8J0652-07	Solid	01-May-08 11:15	27-Oct-2008
RAWTP-17 2"-1'	W8J0652-08	Solid	30-Apr-08 09:25	27-Oct-2008
RAWTP-15 0-2"	W8J0652-09	Solid	30-Apr-08 11:55	27-Oct-2008
RAWTP-10 2"-1'	W8J0652-10	Solid	30-Apr-08 07:40	27-Oct-2008
RAWTP-04 1-2'	W8J0652-11	Solid	01-May-08 11:35	27-Oct-2008
RAWTP-14 1-2'	W8J0652-12	Solid	29-Apr-08 14:40	27-Oct-2008
RAWTP-15 1-2'	W8J0652-13	Solid	30-Apr-08 12:20	27-Oct-2008
RAWTP-06 1-2'	W8J0652-14	Solid	01-May-08 08:15	27-Oct-2008
RAWTP-18 1-2'	W8J0652-15	Solid	29-Apr-08 10:10	27-Oct-2008
RAWTP-27 1-2'	W8J0652-16	Solid	28-Apr-08 13:55	27-Oct-2008
RAWTP-BFD-06	W8J0652-17	Solid	01-May-08 00:00	27-Oct-2008
BFD-10	W8J0652-18	Solid	30-Apr-08 08:41	27-Oct-2008

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.
Sample preparation is defined by the client as per their Data Quality Objectives.
The complete report includes pages for each sample, a full QC report, and a notes section.

Case Narrative

11/14/08mab: Revised report; Cu added per client.

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-03 2''-1'**
SVL Sample ID: **W8J0652-01 (Solid)**

Sampled: 30-Apr-08 08:35
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	2.3	mg/kg	2.0	0.4		W845130	DT	11/10/08 11:14	H3
EPA 6010B	**Arsenic**	98.5	mg/kg	2.5	0.7		W845130	DT	11/10/08 11:14	H3
EPA 6010B	**Barium**	90.6	mg/kg	0.20	0.04		W845130	DT	11/10/08 11:13	H3
EPA 6010B	**Beryllium**	0.416	mg/kg	0.200	0.025		W845130	DT	11/10/08 11:12	H3
EPA 6010B	**Cadmium**	0.53	mg/kg	0.20	0.05		W845130	DT	11/10/08 11:13	H3
EPA 6010B	**Chromium**	11.4	mg/kg	0.60	0.11		W845130	DT	11/10/08 11:13	H3
EPA 6010B	**Copper**	2190	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 09:27	D2,H3
EPA 6010B	**Lead**	51.3	mg/kg	0.75	0.25		W845130	DT	11/10/08 11:14	H3
EPA 6010B	**Nickel**	18.7	mg/kg	1.00	0.19		W845130	DT	11/10/08 11:13	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 11:14	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 11:14	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.430	mg/kg	0.033	0.010		W845164	JAA	11/11/08 01:39	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.25	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.004	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 05:05	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 05:04	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 05:05	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 05:05	H3
EPA 6010B	**Copper**	0.13	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 05:05	H3
EPA 6010B	Lead	< 0.0075	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 05:05	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 05:05	H3
EPA 6020	**Antimony**	0.0069	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:04	D1,H3
EPA 6020	**Arsenic**	0.340	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:04	D2,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:04	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:04	D1,H3
EPA 7470A	**Mercury**	0.0011	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:41	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-24 0-2"**
SVL Sample ID: **W8J0652-02 (Solid)**

Sampled: 29-Apr-08 08:50
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	3.1	mg/kg	2.0	0.4		W845130	DT	11/10/08 11:32	H3
EPA 6010B	**Arsenic**	157	mg/kg	2.5	0.7		W845130	DT	11/10/08 11:32	H3
EPA 6010B	**Barium**	82.7	mg/kg	0.20	0.04		W845130	DT	11/10/08 11:31	H3
EPA 6010B	**Beryllium**	0.456	mg/kg	0.200	0.025		W845130	DT	11/10/08 11:30	H3
EPA 6010B	**Cadmium**	0.53	mg/kg	0.20	0.05		W845130	DT	11/10/08 11:31	H3
EPA 6010B	**Chromium**	9.83	mg/kg	0.60	0.11		W845130	DT	11/10/08 11:32	H3
EPA 6010B	**Copper**	1880	mg/kg	1.00	0.29		W845130	DT	11/10/08 11:31	H3
EPA 6010B	**Lead**	110	mg/kg	0.75	0.25		W845130	DT	11/10/08 11:32	H3
EPA 6010B	**Nickel**	10.1	mg/kg	1.00	0.19		W845130	DT	11/10/08 11:31	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 11:32	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 11:32	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.263	mg/kg	0.033	0.010		W845164	JAA	11/11/08 01:47	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.14	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.004	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 05:23	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 05:21	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 05:23	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 05:23	H3
EPA 6010B	**Copper**	0.11	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 05:22	H3
EPA 6010B	**Lead**	0.0079	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 05:23	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 05:23	H3
EPA 6020	**Antimony**	0.0031	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:12	D1,H3
EPA 6020	**Arsenic**	0.070	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:12	D1,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:12	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:12	D1,H3
EPA 7470A	**Mercury**	0.0022	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:46	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-20 0-2"**
SVL Sample ID: **W8J0652-03 (Solid)**

Sampled: 01-May-08 13:05
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	4.0	mg/kg	2.0	0.4		W845130	DT	11/10/08 11:37	H3
EPA 6010B	**Arsenic**	144	mg/kg	2.5	0.7		W845130	DT	11/10/08 11:37	H3
EPA 6010B	**Barium**	78.8	mg/kg	0.20	0.04		W845130	DT	11/10/08 11:37	H3
EPA 6010B	**Beryllium**	0.362	mg/kg	0.200	0.025		W845130	DT	11/10/08 11:36	H3
EPA 6010B	**Cadmium**	0.30	mg/kg	0.20	0.05		W845130	DT	11/10/08 11:37	H3
EPA 6010B	**Chromium**	5.41	mg/kg	0.60	0.11		W845130	DT	11/10/08 11:37	H3
EPA 6010B	**Copper**	2210	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 09:56	D2,H3
EPA 6010B	**Lead**	143	mg/kg	0.75	0.25		W845130	DT	11/10/08 11:37	H3
EPA 6010B	**Nickel**	5.54	mg/kg	1.00	0.19		W845130	DT	11/10/08 11:37	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 11:37	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 11:37	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.775	mg/kg	0.033	0.010		W845164	JAA	11/11/08 01:48	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.72	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.02	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 05:28	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 05:27	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 05:28	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 05:28	H3
EPA 6010B	**Copper**	0.46	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 05:28	H3
EPA 6010B	**Lead**	0.0180	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 05:28	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 05:28	H3
EPA 6020	**Antimony**	0.0125	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:14	D1,H3
EPA 6020	**Arsenic**	0.254	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:14	D2,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:14	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:14	D1,H3
EPA 7470A	**Mercury**	0.0003	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:51	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-09 2"-1**
SVL Sample ID: **W8J0652-04 (Solid)**

Sampled: 30-Apr-08 13:40
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	4.7	mg/kg	2.0	0.4		W845130	DT	11/10/08 11:49	H3
EPA 6010B	**Arsenic**	355	mg/kg	2.5	0.7		W845130	DT	11/10/08 11:49	H3
EPA 6010B	**Barium**	89.9	mg/kg	0.20	0.04		W845130	DT	11/10/08 11:49	H3
EPA 6010B	**Beryllium**	0.480	mg/kg	0.200	0.025		W845130	DT	11/10/08 11:47	H3
EPA 6010B	**Cadmium**	1.88	mg/kg	0.20	0.05		W845130	DT	11/10/08 11:49	H3
EPA 6010B	**Chromium**	23.1	mg/kg	0.60	0.11		W845130	DT	11/10/08 11:49	H3
EPA 6010B	**Copper**	6410	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 10:02	D2,H3
EPA 6010B	**Lead**	161	mg/kg	0.75	0.25		W845130	DT	11/10/08 11:49	H3
EPA 6010B	**Nickel**	25.2	mg/kg	1.00	0.19		W845130	DT	11/10/08 11:49	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 11:49	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 11:49	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.232	mg/kg	0.033	0.010		W845164	JAA	11/11/08 01:50	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.93	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.02	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 05:34	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 05:33	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 05:34	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 05:34	H3
EPA 6010B	**Copper**	0.67	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 05:34	H3
EPA 6010B	**Lead**	0.0138	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 05:34	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 05:34	H3
EPA 6020	**Antimony**	0.0149	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:17	H3,D1
EPA 6020	**Arsenic**	0.597	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:17	D2,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:17	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:17	D1,H3
EPA 7470A	**Mercury**	0.0039	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:52	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-18 0-2"**
SVL Sample ID: **W8J0652-05 (Solid)**

Sampled: 29-Apr-08 09:45
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	8.4	mg/kg	2.0	0.4		W845130	DT	11/10/08 11:55	H3
EPA 6010B	**Arsenic**	567	mg/kg	2.5	0.7		W845130	DT	11/10/08 11:55	H3
EPA 6010B	**Barium**	117	mg/kg	0.20	0.04		W845130	DT	11/10/08 11:55	H3
EPA 6010B	**Beryllium**	0.423	mg/kg	0.200	0.025		W845130	DT	11/10/08 11:53	H3
EPA 6010B	**Cadmium**	1.83	mg/kg	0.20	0.05		W845130	DT	11/10/08 11:55	H3
EPA 6010B	**Chromium**	8.02	mg/kg	0.60	0.11		W845130	DT	11/10/08 11:55	H3
EPA 6010B	**Copper**	13300	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 10:07	D2,H3
EPA 6010B	**Lead**	264	mg/kg	0.75	0.25		W845130	DT	11/10/08 11:55	H3
EPA 6010B	**Nickel**	12.2	mg/kg	1.00	0.19		W845130	DT	11/10/08 11:55	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 11:55	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 11:55	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.573	mg/kg	0.033	0.010		W845164	JAA	11/11/08 01:52	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.87	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.02	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 05:40	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 05:38	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 05:40	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 05:40	H3
EPA 6010B	**Copper**	0.49	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 05:39	H3
EPA 6010B	Lead	< 0.0075	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 05:40	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 05:40	H3
EPA 6020	**Antimony**	0.0163	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:19	D1,H3
EPA 6020	**Arsenic**	0.595	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:19	D2,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:19	H3,D1
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:19	D1,H3
EPA 7470A	**Mercury**	0.0006	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:54	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-12 0-2"**
SVL Sample ID: **W8J0652-06 (Solid)**

Sampled: 28-Apr-08 15:25
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	11.2	mg/kg	2.0	0.4		W845130	DT	11/10/08 12:49	H3
EPA 6010B	**Arsenic**	949	mg/kg	2.5	0.7		W845130	DT	11/10/08 12:49	H3
EPA 6010B	**Barium**	112	mg/kg	0.20	0.04		W845130	DT	11/10/08 12:48	H3
EPA 6010B	**Beryllium**	0.415	mg/kg	0.200	0.025		W845130	DT	11/10/08 12:46	H3
EPA 6010B	**Cadmium**	4.65	mg/kg	0.20	0.05		W845130	DT	11/10/08 12:48	H3
EPA 6010B	**Chromium**	20.8	mg/kg	0.60	0.11		W845130	DT	11/10/08 12:49	H3
EPA 6010B	**Copper**	18800	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 10:13	D2,H3
EPA 6010B	**Lead**	489	mg/kg	0.75	0.25		W845130	DT	11/10/08 12:48	H3
EPA 6010B	**Nickel**	26.2	mg/kg	1.00	0.19		W845130	DT	11/10/08 12:48	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 12:49	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 12:49	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.978	mg/kg	0.033	0.010		W845164	JAA	11/11/08 01:53	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.18	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.02	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 05:46	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 05:44	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 05:46	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 05:46	H3
EPA 6010B	**Copper**	2.74	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 05:45	H3
EPA 6010B	**Lead**	0.117	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 05:46	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 05:46	H3
EPA 6020	**Antimony**	0.0223	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:31	D1,H3
EPA 6020	**Arsenic**	0.767	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:31	D2,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:31	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:31	H3,D1
EPA 7470A	**Mercury**	0.0025	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:56	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-04 0-2"**
SVL Sample ID: **W8J0652-07 (Solid)**

Sampled: 01-May-08 11:15
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	16.0	mg/kg	2.0	0.4		W845130	DT	11/10/08 12:55	H3
EPA 6010B	**Arsenic**	1070	mg/kg	2.5	0.7		W845130	DT	11/10/08 12:55	H3
EPA 6010B	**Barium**	124	mg/kg	0.20	0.04		W845130	DT	11/10/08 12:55	H3
EPA 6010B	**Beryllium**	0.583	mg/kg	0.200	0.025		W845130	DT	11/10/08 12:53	H3
EPA 6010B	**Cadmium**	5.78	mg/kg	0.20	0.05		W845130	DT	11/10/08 12:55	H3
EPA 6010B	**Chromium**	11.4	mg/kg	0.60	0.11		W845130	DT	11/10/08 12:55	H3
EPA 6010B	**Copper**	50100	mg/kg	100	29.0	100	W845130	DG	11/14/08 11:12	D2,H3
EPA 6010B	**Lead**	448	mg/kg	0.75	0.25		W845130	DT	11/10/08 12:55	H3
EPA 6010B	**Nickel**	20.6	mg/kg	1.00	0.19		W845130	DT	11/10/08 12:55	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 12:55	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 12:55	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	2.92	mg/kg	0.330	0.097	10	W845164	JAA	11/11/08 02:56	D2,H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.86	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.03	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:03	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:01	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:03	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:03	H3
EPA 6010B	**Copper**	0.97	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:02	H3
EPA 6010B	**Lead**	0.0264	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:03	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:03	H3
EPA 6020	**Antimony**	0.0163	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:33	D1,H3
EPA 6020	**Arsenic**	1.63	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:33	D2,H3
EPA 6020	**Selenium**	0.0031	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:33	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:33	D1,H3
EPA 7470A	**Mercury**	0.0012	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:58	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-17 2"-1'**
SVL Sample ID: **W8J0652-08 (Solid)**

Sampled: 30-Apr-08 09:25
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	16.0	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:02	H3
EPA 6010B	**Arsenic**	1520	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:02	H3
EPA 6010B	**Barium**	129	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:02	H3
EPA 6010B	**Beryllium**	0.469	mg/kg	0.200	0.025		W845130	DT	11/10/08 12:59	H3
EPA 6010B	**Cadmium**	3.78	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:02	H3
EPA 6010B	**Chromium**	6.27	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:02	H3
EPA 6010B	**Copper**	27900	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 10:50	D2,H3
EPA 6010B	**Lead**	457	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:02	H3
EPA 6010B	**Nickel**	15.8	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:02	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:02	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:02	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	1.95	mg/kg	0.330	0.097	10	W845164	JAA	11/11/08 02:57	D2,H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	7.87	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.02	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:09	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:07	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:09	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:09	H3
EPA 6010B	**Copper**	0.15	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:08	H3
EPA 6010B	Lead	< 0.0075	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:09	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:09	H3
EPA 6020	**Antimony**	0.0242	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:35	D1,H3
EPA 6020	**Arsenic**	0.236	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:35	D2,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:35	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:35	D1,H3
EPA 7470A	**Mercury**	0.0056	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:59	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-15 0-2"**
SVL Sample ID: **W8J0652-09 (Solid)**

Sampled: 30-Apr-08 11:55
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	5.3	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Arsenic**	385	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Barium**	95.8	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Beryllium**	0.365	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:06	H3
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Chromium**	13.3	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Copper**	1200	mg/kg	1.00	0.29		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Lead**	161	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Nickel**	10.7	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:08	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:08	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:08	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.508	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:02	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	5.58	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.03	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:14	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:13	H3
EPA 6010B	**Cadmium**	0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:14	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:14	H3
EPA 6010B	**Copper**	1.97	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:14	H3
EPA 6010B	Lead	< 0.0075	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:14	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:14	H3
EPA 6020	Antimony	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:37	D1,H3
EPA 6020	**Arsenic**	0.008	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:37	D1,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:37	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:37	D1,H3
EPA 7470A	Mercury	< 0.0002	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:01	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-10 2"-1'**
SVL Sample ID: **W8J0652-10 (Solid)**

Sampled: 30-Apr-08 07:40
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	6.7	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:14	H3
EPA 6010B	**Arsenic**	559	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:14	H3
EPA 6010B	**Barium**	125	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:14	H3
EPA 6010B	**Beryllium**	0.507	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:12	H3
EPA 6010B	**Cadmium**	1.99	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:14	H3
EPA 6010B	**Chromium**	8.34	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:14	H3
EPA 6010B	**Copper**	13800	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 10:55	D2,H3
EPA 6010B	**Lead**	187	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:14	H3
EPA 6010B	**Nickel**	13.6	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:14	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:14	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:14	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.540	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:03	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	6.91	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.04	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:20	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:19	H3
EPA 6010B	**Cadmium**	0.004	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:20	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:20	H3
EPA 6010B	**Copper**	2.12	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:20	H3
EPA 6010B	Lead	< 0.0075	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:20	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:20	H3
EPA 6020	**Antimony**	0.0257	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:39	D1,H3
EPA 6020	**Arsenic**	1.44	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:39	D2,H3
EPA 6020	**Selenium**	0.0049	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:39	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:39	D1,H3
EPA 7470A	**Mercury**	0.0026	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:02	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-04 1-2'**
SVL Sample ID: **W8J0652-11 (Solid)**

Sampled: 01-May-08 11:35
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	3.6	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:21	H3
EPA 6010B	**Arsenic**	185	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:21	H3
EPA 6010B	**Barium**	128	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:21	H3
EPA 6010B	**Beryllium**	0.528	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:19	H3
EPA 6010B	**Cadmium**	1.00	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:21	H3
EPA 6010B	**Chromium**	11.7	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:21	H3
EPA 6010B	**Copper**	8560	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 11:01	D2,H3
EPA 6010B	**Lead**	71.9	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:21	H3
EPA 6010B	**Nickel**	17.1	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:21	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:21	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:21	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.445	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:05	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.05	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.01	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:26	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:24	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:26	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:26	H3
EPA 6010B	**Copper**	0.09	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:25	H3
EPA 6010B	Lead	< 0.0075	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:26	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:26	H3
EPA 6020	**Antimony**	0.0116	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:41	D1,H3
EPA 6020	**Arsenic**	0.985	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:41	D2,H3
EPA 6020	**Selenium**	0.0031	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:41	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:41	D1,H3
EPA 7470A	**Mercury**	0.0037	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:04	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-14 1-2'**
SVL Sample ID: **W8J0652-12 (Solid)**

Sampled: 29-Apr-08 14:40
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Arsenic**	99.6	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Barium**	95.2	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Beryllium**	0.637	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:25	H3
EPA 6010B	**Cadmium**	0.20	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Chromium**	4.71	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Copper**	702	mg/kg	1.00	0.29		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Lead**	17.9	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Nickel**	12.0	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:27	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:27	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:27	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.415	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:10	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.26	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.03	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:31	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:30	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:31	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:31	H3
EPA 6010B	**Copper**	0.27	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:31	H3
EPA 6010B	**Lead**	0.0076	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:31	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:31	H3
EPA 6020	**Antimony**	0.0214	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:44	D1,H3
EPA 6020	**Arsenic**	0.404	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:44	D2,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:44	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:44	D1,H3
EPA 7470A	**Mercury**	0.0006	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:06	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-15 1-2'**
SVL Sample ID: **W8J0652-13 (Solid)**

Sample Report Page 1 of 1

Sampled: 30-Apr-08 12:20
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	2.5	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:33	H3
EPA 6010B	**Arsenic**	104	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:33	H3
EPA 6010B	**Barium**	145	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:33	H3
EPA 6010B	**Beryllium**	0.908	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:31	H3
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:33	H3
EPA 6010B	**Chromium**	9.67	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:33	H3
EPA 6010B	**Copper**	948	mg/kg	1.00	0.29		W845130	DT	11/10/08 01:32	H3
EPA 6010B	**Lead**	43.7	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:33	H3
EPA 6010B	**Nickel**	15.2	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:33	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:33	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:33	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.133	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:11	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.67	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.02	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:37	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:36	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:37	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:37	H3
EPA 6010B	**Copper**	0.12	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:37	H3
EPA 6010B	Lead	< 0.0075	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:37	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:37	H3
EPA 6020	**Antimony**	0.0042	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:46	D1,H3
EPA 6020	**Arsenic**	0.104	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:46	D2,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:46	H3,D1
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:46	D1,H3
EPA 7470A	**Mercury**	0.0002	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:11	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-06 1-2'**
SVL Sample ID: **W8J0652-14 (Solid)**

Sample Report Page 1 of 1

Sampled: 01-May-08 08:15
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Arsenic**	69.3	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Barium**	113	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Beryllium**	0.260	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:38	H3
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Chromium**	12.8	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Copper**	417	mg/kg	1.00	0.29		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Lead**	14.2	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Nickel**	16.4	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:39	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:39	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:39	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.065	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:13	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.04	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.007	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:43	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:41	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:43	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:43	H3
EPA 6010B	**Copper**	0.02	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:43	H3
EPA 6010B	Lead	< 0.0075	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:43	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:43	H3
EPA 6020	**Antimony**	0.0137	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:48	D1,H3
EPA 6020	**Arsenic**	0.552	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:48	D2,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:48	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:48	D1,H3
EPA 7470A	Mercury	< 0.0002	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:12	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-18 1-2'**
SVL Sample ID: **W8J0652-15 (Solid)**

Sampled: 29-Apr-08 10:10
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0	mg/kg	2.0	0.4		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Arsenic**	15.7	mg/kg	2.5	0.7		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Barium**	82.8	mg/kg	0.20	0.04		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Beryllium**	0.479	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:59	H3
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.05		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Chromium**	5.02	mg/kg	0.60	0.11		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Copper**	52.2	mg/kg	1.00	0.29		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Lead**	7.83	mg/kg	0.75	0.25		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Nickel**	8.65	mg/kg	1.00	0.19		W845130	DT	11/10/08 02:00	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 02:00	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 02:00	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.055	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:15	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.28	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.008	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:49	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:47	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:49	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:49	H3
EPA 6010B	**Copper**	0.03	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:48	H3
EPA 6010B	Lead	< 0.0075	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:49	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:49	H3
EPA 6020	Antimony	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:55	D1,H3
EPA 6020	**Arsenic**	0.076	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:55	D1,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:55	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:55	D1,H3
EPA 7470A	**Mercury**	0.0004	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:14	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-27 1-2'**
SVL Sample ID: **W8J0652-16 (Solid)**

Sampled: 28-Apr-08 13:55
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0	mg/kg	2.0	0.4		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Arsenic**	58.1	mg/kg	2.5	0.7		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Barium**	81.3	mg/kg	0.20	0.04		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Beryllium**	0.546	mg/kg	0.200	0.025		W845130	DT	11/10/08 02:04	H3
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.05		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Chromium**	3.45	mg/kg	0.60	0.11		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Copper**	492	mg/kg	1.00	0.29		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Lead**	16.7	mg/kg	0.75	0.25		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Nickel**	7.95	mg/kg	1.00	0.19		W845130	DT	11/10/08 02:06	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 02:06	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 02:06	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.163	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:16	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.57	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.004	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:54	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:53	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:54	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:54	H3
EPA 6010B	**Copper**	0.08	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:54	H3
EPA 6010B	Lead	< 0.0075	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:54	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:54	H3
EPA 6020	**Antimony**	0.0039	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:57	D1,H3
EPA 6020	**Arsenic**	0.314	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:57	D2,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:57	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:57	D1,H3
EPA 7470A	**Mercury**	0.0006	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:16	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-BFD-06**
SVL Sample ID: **W8J0652-17 (Solid)**

Sampled: 01-May-08 00:00
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	3.7	mg/kg	2.0	0.4		W845130	DT	11/10/08 02:12	H3
EPA 6010B	**Arsenic**	133	mg/kg	2.5	0.7		W845130	DT	11/10/08 02:12	H3
EPA 6010B	**Barium**	78.0	mg/kg	0.20	0.04		W845130	DT	11/10/08 02:12	H3
EPA 6010B	**Beryllium**	0.361	mg/kg	0.200	0.025		W845130	DT	11/10/08 02:10	H3
EPA 6010B	**Cadmium**	0.34	mg/kg	0.20	0.05		W845130	DT	11/10/08 02:12	H3
EPA 6010B	**Chromium**	4.29	mg/kg	0.60	0.11		W845130	DT	11/10/08 02:12	H3
EPA 6010B	**Copper**	2710	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 11:07	D2,H3
EPA 6010B	**Lead**	143	mg/kg	0.75	0.25		W845130	DT	11/10/08 02:12	H3
EPA 6010B	**Nickel**	5.90	mg/kg	1.00	0.19		W845130	DT	11/10/08 02:12	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 02:12	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 02:12	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.623	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:18	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	7.99	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.03	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 07:11	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 07:10	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 07:11	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 07:11	H3
EPA 6010B	**Copper**	0.76	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 07:11	H3
EPA 6010B	**Lead**	0.0373	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 07:11	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 07:11	H3
EPA 6020	**Antimony**	0.0171	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 08:00	D1,H3
EPA 6020	**Arsenic**	0.310	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 08:00	H3,D2
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 08:00	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 08:00	D1,H3
EPA 7470A	**Mercury**	0.0008	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:17	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **BFD-10**
SVL Sample ID: **W8J0652-18 (Solid)**

Sampled: 30-Apr-08 08:41
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0	mg/kg	2.0	0.4		W845130	DT	11/10/08 02:18	H3
EPA 6010B	**Arsenic**	34.7	mg/kg	2.5	0.7		W845130	DT	11/10/08 02:18	H3
EPA 6010B	**Barium**	87.6	mg/kg	0.20	0.04		W845130	DT	11/10/08 02:18	H3
EPA 6010B	**Beryllium**	0.372	mg/kg	0.200	0.025		W845130	DT	11/10/08 02:16	H3
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.05		W845130	DT	11/10/08 02:18	H3
EPA 6010B	**Chromium**	9.94	mg/kg	0.60	0.11		W845130	DT	11/10/08 02:18	H3
EPA 6010B	**Copper**	613	mg/kg	1.00	0.29		W845130	DT	11/10/08 02:17	H3
EPA 6010B	**Lead**	19.1	mg/kg	0.75	0.25		W845130	DT	11/10/08 02:18	H3
EPA 6010B	**Nickel**	19.8	mg/kg	1.00	0.19		W845130	DT	11/10/08 02:18	H3
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.1		W845130	DT	11/10/08 02:18	H3
EPA 6010B	Thallium	< 1.5	mg/kg	1.5	0.3		W845130	DT	11/10/08 02:18	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.162	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:20	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.26	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.004	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 07:17	H3
EPA 6010B	Beryllium	< 0.002	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 07:16	H3
EPA 6010B	Cadmium	< 0.002	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 07:17	H3
EPA 6010B	Chromium	< 0.006	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 07:17	H3
EPA 6010B	**Copper**	0.07	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 07:17	H3
EPA 6010B	Lead	< 0.0075	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 07:17	H3
EPA 6010B	Nickel	< 0.01	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 07:17	H3
EPA 6020	**Antimony**	0.0038	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 08:02	H3,D1
EPA 6020	**Arsenic**	0.222	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 08:02	D2,H3
EPA 6020	Selenium	< 0.0030	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 08:02	D1,H3
EPA 6020	Thallium	< 0.001	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 08:02	D1,H3
EPA 7470A	**Mercury**	0.0008	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:19	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods								
EPA 6010B	Antimony	mg/kg	<2.0	0.4	2.0	W845130	10-Nov-08	
EPA 6010B	Arsenic	mg/kg	<2.5	0.7	2.5	W845130	10-Nov-08	
EPA 6010B	Barium	mg/kg	<0.20	0.04	0.20	W845130	10-Nov-08	
EPA 6010B	Beryllium	mg/kg	<0.200	0.025	0.200	W845130	10-Nov-08	
EPA 6010B	Cadmium	mg/kg	<0.20	0.05	0.20	W845130	10-Nov-08	
EPA 6010B	Chromium	mg/kg	<0.60	0.11	0.60	W845130	10-Nov-08	
EPA 6010B	Copper	mg/kg	<1.00	0.29	1.00	W845130	10-Nov-08	
EPA 6010B	Lead	mg/kg	<0.75	0.25	0.75	W845130	10-Nov-08	
EPA 6010B	Nickel	mg/kg	<1.00	0.19	1.00	W845130	10-Nov-08	
EPA 6010B	Selenium	mg/kg	<4.0	1.1	4.0	W845130	10-Nov-08	
EPA 6010B	Thallium	mg/kg	<1.5	0.3	1.5	W845130	10-Nov-08	
Mercury by SW846 Methods								
EPA 7471A	Mercury	mg/kg	<0.033	0.010	0.033	W845164	11-Nov-08	
SPLP Leachates (Metals)								
EPA 6010B	Barium	mg/L Extract	<0.002	0.0005	0.002	W845052	10-Nov-08	
EPA 6010B	Beryllium	mg/L Extract	<0.002	0.0004	0.002	W845052	10-Nov-08	
EPA 6010B	Cadmium	mg/L Extract	<0.002	0.001	0.002	W845052	10-Nov-08	
EPA 6010B	Chromium	mg/L Extract	<0.006	0.001	0.006	W845052	10-Nov-08	
EPA 6010B	Copper	mg/L Extract	<0.01	0.004	0.01	W845052	10-Nov-08	
EPA 6010B	Lead	mg/L Extract	<0.0075	0.0039	0.0075	W845052	10-Nov-08	
EPA 6010B	Nickel	mg/L Extract	<0.01	0.002	0.01	W845052	10-Nov-08	
EPA 6020	Antimony	mg/L Extract	<0.0030	0.0005	0.0030	W845038	11-Nov-08	D1
EPA 6020	Antimony	mg/L Extract	<0.0030	0.0005	0.0030	W845038	11-Nov-08	D1
EPA 6020	Arsenic	mg/L Extract	<0.004	0.0007	0.004	W845038	11-Nov-08	D1
EPA 6020	Arsenic	mg/L Extract	<0.004	0.0007	0.004	W845038	11-Nov-08	D1
EPA 6020	Selenium	mg/L Extract	<0.0030	0.0005	0.0030	W845038	11-Nov-08	D1
EPA 6020	Selenium	mg/L Extract	<0.0030	0.0005	0.0030	W845038	11-Nov-08	D1
EPA 6020	Thallium	mg/L Extract	<0.001	0.00009	0.001	W845038	11-Nov-08	D1
EPA 6020	Thallium	mg/L Extract	<0.001	0.00009	0.001	W845038	11-Nov-08	D1
EPA 7470A	Mercury	mg/L Extract	<0.0002	0.00008	0.0002	W846032	10-Nov-08	
EPA 7470A	Mercury	mg/L Extract	<0.0002	0.00008	0.0002	W846032	10-Nov-08	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods									
EPA 6010B	Antimony	mg/kg	98.2	100	98.2	80 - 120	W845130	10-Nov-08	
EPA 6010B	Arsenic	mg/kg	99.5	100	99.5	80 - 120	W845130	10-Nov-08	
EPA 6010B	Barium	mg/kg	97.2	100	97.2	80 - 120	W845130	10-Nov-08	
EPA 6010B	Beryllium	mg/kg	95.3	100	95.3	80 - 120	W845130	10-Nov-08	
EPA 6010B	Cadmium	mg/kg	97.3	100	97.3	80 - 120	W845130	10-Nov-08	
EPA 6010B	Chromium	mg/kg	98.6	100	98.6	80 - 120	W845130	10-Nov-08	
EPA 6010B	Copper	mg/kg	95.6	100	95.6	80 - 120	W845130	10-Nov-08	
EPA 6010B	Lead	mg/kg	94.6	100	94.6	80 - 120	W845130	10-Nov-08	
EPA 6010B	Nickel	mg/kg	94.3	100	94.3	80 - 120	W845130	10-Nov-08	
EPA 6010B	Selenium	mg/kg	100	100	100	80 - 120	W845130	10-Nov-08	
EPA 6010B	Thallium	mg/kg	94.9	100	94.9	80 - 120	W845130	10-Nov-08	
Mercury by SW846 Methods									
EPA 7471A	Mercury	mg/kg	0.827	0.833	99.2	90.4 - 120	W845164	11-Nov-08	

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
SPLP Leachates (Metals)									
EPA 6010B	Barium	mg/L Extract	0.94	1.00	93.8	80 - 120	W845052	10-Nov-08	
EPA 6010B	Beryllium	mg/L Extract	0.941	1.00	94.1	80 - 120	W845052	10-Nov-08	
EPA 6010B	Cadmium	mg/L Extract	0.925	1.00	92.5	80 - 120	W845052	10-Nov-08	
EPA 6010B	Chromium	mg/L Extract	0.942	1.00	94.2	80 - 120	W845052	10-Nov-08	
EPA 6010B	Copper	mg/L Extract	0.95	1.00	94.8	80 - 120	W845052	10-Nov-08	
EPA 6010B	Lead	mg/L Extract	0.907	1.00	90.7	80 - 120	W845052	10-Nov-08	
EPA 6010B	Nickel	mg/L Extract	0.92	1.00	92.1	80 - 120	W845052	10-Nov-08	
EPA 6020	Antimony	mg/L Extract	0.0277	0.0250	111	85 - 115	W845038	11-Nov-08	D1
EPA 6020	Arsenic	mg/L Extract	0.028	0.0250	111	85 - 115	W845038	11-Nov-08	D1
EPA 6020	Selenium	mg/L Extract	0.0250	0.0250	99.8	85 - 115	W845038	11-Nov-08	D1
EPA 6020	Thallium	mg/L Extract	0.027	0.0250	108	85 - 115	W845038	11-Nov-08	D1
EPA 7470A	Mercury	mg/L Extract	0.0047	0.00500	93.2	87.5 - 118	W846032	10-Nov-08	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	mg/kg	50.0	2.3	100	47.7	75 - 125	W845130	10-Nov-08	H3,M2
EPA 6010B	Arsenic	mg/kg	188	98.5	100	89.5	75 - 125	W845130	10-Nov-08	H3
EPA 6010B	Barium	mg/kg	194	90.6	100	104	75 - 125	W845130	10-Nov-08	H3
EPA 6010B	Beryllium	mg/kg	92.6	0.416	100	92.2	75 - 125	W845130	10-Nov-08	H3
EPA 6010B	Cadmium	mg/kg	82.7	0.53	100	82.1	75 - 125	W845130	10-Nov-08	H3
EPA 6010B	Chromium	mg/kg	103	11.4	100	91.6	75 - 125	W845130	10-Nov-08	H3
EPA 6010B	Copper	mg/kg	2270	2190	100	80.3	75 - 125	W845130	14-Nov-08	D2,H3,M3
EPA 6010B	Lead	mg/kg	142	51.3	100	90.9	75 - 125	W845130	10-Nov-08	H3
EPA 6010B	Nickel	mg/kg	114	18.7	100	94.9	75 - 125	W845130	10-Nov-08	H3
EPA 6010B	Selenium	mg/kg	73.6	<4.0	100	73.6	75 - 125	W845130	10-Nov-08	H3,M2
EPA 6010B	Thallium	mg/kg	86.8	<1.5	100	86.8	75 - 125	W845130	10-Nov-08	H3
Mercury by SW846 Methods										
EPA 7471A	Mercury	mg/kg	0.582	0.430	0.167	91.0	75 - 125	W845164	11-Nov-08	
SPLP Leachates (Metals)										
EPA 6010B	Barium	mg/L Extract	0.94	0.004	1.00	93.1	75 - 125	W845052	10-Nov-08	
EPA 6010B	Beryllium	mg/L Extract	0.942	<0.002	1.00	94.2	75 - 125	W845052	10-Nov-08	
EPA 6010B	Cadmium	mg/L Extract	0.914	<0.002	1.00	91.4	75 - 125	W845052	10-Nov-08	
EPA 6010B	Chromium	mg/L Extract	0.937	<0.006	1.00	93.5	75 - 125	W845052	10-Nov-08	
EPA 6010B	Copper	mg/L Extract	1.07	0.13	1.00	94.1	75 - 125	W845052	10-Nov-08	
EPA 6010B	Lead	mg/L Extract	0.922	<0.0075	1.00	92.2	75 - 125	W845052	10-Nov-08	
EPA 6010B	Nickel	mg/L Extract	0.90	<0.01	1.00	90.2	75 - 125	W845052	10-Nov-08	
EPA 6020	Antimony	mg/L Extract	0.0319	0.0069	0.0250	100	75 - 125	W845038	11-Nov-08	D1
EPA 6020	Arsenic	mg/L Extract	0.345	0.340	0.0250	R > 4S	75 - 125	W845038	11-Nov-08	D2,M3
EPA 6020	Selenium	mg/L Extract	0.0255	<0.0030	0.0250	94.3	75 - 125	W845038	11-Nov-08	D1
EPA 6020	Thallium	mg/L Extract	0.026	<0.001	0.0250	106	75 - 125	W845038	11-Nov-08	D1
EPA 7470A	Mercury	mg/L Extract	0.0028	0.0011	0.00100	171	65.9 - 132	W846032	10-Nov-08	M1

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	mg/kg	49.2	50.0	100	1.8	20	W845130	10-Nov-08	H3
EPA 6010B	Arsenic	mg/kg	171	188	100	9.3	20	W845130	10-Nov-08	H3
EPA 6010B	Barium	mg/kg	206	194	100	5.8	20	W845130	10-Nov-08	H3
EPA 6010B	Beryllium	mg/kg	91.2	92.6	100	1.5	20	W845130	10-Nov-08	H3
EPA 6010B	Cadmium	mg/kg	83.8	82.7	100	1.4	20	W845130	10-Nov-08	H3
EPA 6010B	Chromium	mg/kg	104	103	100	0.4	20	W845130	10-Nov-08	H3
EPA 6010B	Copper	mg/kg	1670	2270	100	30.8	20	W845130	14-Nov-08	D2,H3
EPA 6010B	Lead	mg/kg	132	142	100	7.1	20	W845130	10-Nov-08	H3
EPA 6010B	Nickel	mg/kg	115	114	100	1.3	20	W845130	10-Nov-08	H3
EPA 6010B	Selenium	mg/kg	73.7	73.6	100	0.1	20	W845130	10-Nov-08	H3
EPA 6010B	Thallium	mg/kg	85.4	86.8	100	1.5	20	W845130	10-Nov-08	H3
Mercury by SW846 Methods										
EPA 7471A	Mercury	mg/kg	0.557	0.582	0.167	4.4	20	W845164	11-Nov-08	
SPLP Leachates (Metals)										
EPA 6010B	Barium	mg/L Extract	0.94	0.94	1.00	0.8	20	W845052	10-Nov-08	
EPA 6010B	Beryllium	mg/L Extract	0.945	0.942	1.00	0.4	20	W845052	10-Nov-08	
EPA 6010B	Cadmium	mg/L Extract	0.920	0.914	1.00	0.7	20	W845052	10-Nov-08	
EPA 6010B	Chromium	mg/L Extract	0.944	0.937	1.00	0.8	20	W845052	10-Nov-08	
EPA 6010B	Copper	mg/L Extract	1.08	1.07	1.00	0.9	20	W845052	10-Nov-08	
EPA 6010B	Lead	mg/L Extract	0.921	0.922	1.00	0.0	20	W845052	10-Nov-08	
EPA 6010B	Nickel	mg/L Extract	0.90	0.90	1.00	0.2	20	W845052	10-Nov-08	
EPA 6020	Antimony	mg/L Extract	0.0352	0.0319	0.0250	9.8	20	W845038	11-Nov-08	D1
EPA 6020	Arsenic	mg/L Extract	0.371	0.345	0.0250	7.4	20	W845038	11-Nov-08	D2,M3
EPA 6020	Selenium	mg/L Extract	0.0282	0.0255	0.0250	10.1	200	W845038	11-Nov-08	D1
EPA 6020	Thallium	mg/L Extract	0.027	0.026	0.0250	3.4	20	W845038	11-Nov-08	D1
EPA 7470A	Mercury	mg/L Extract	0.0030	0.0028	0.00100	8.3	20	W846032	10-Nov-08	M1

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	mg/kg	86.7	2.3	100	84.4	75 - 125	W845130	10-Nov-08	H3
EPA 6010B	Selenium	mg/kg	77.4	<4.0	100	77.4	75 - 125	W845130	10-Nov-08	H3

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Notes and Definitions

D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of target analyte.
H3	Sample was received and analyzed past holding time.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M2	Matrix spike recovery was low, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

Innovative Technical Solutions, Inc.
A Gilbane Company

October 12, 2011

Dr. Casey McKeon
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

RE: ITSI DATA VALIDATION REPORT
RESOLUTION COPPER MINING
HUMAN HEALTH RISK ASSESSMENT
SDG W8J0652

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) has completed the data review for Resolution Copper Mining (RCM) for its Human Health Risk Assessment (HHRA) soil samples collected in 2008. ITSI performed data review as described in the U.S. Environmental Protection Agency's (EPA) *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004; and the *Sampling and Analysis Plan (SAP) for Clean Closure at Resolution Copper Mining Limited (Resolution), West Plant Site, Superior Mine* , (Golder, June 2005).

The acronym and abbreviations list is included as Appendix A. Data review qualifiers have been marked in red directly on the analytical reports provided by the laboratory and are attached as Appendix B. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C. A summary of the field duplicate pair results is provided in the Field Duplicate Table as Appendix D. Client communications are provided as Appendix E. The ITSI standard legal notice is provided as Appendix F.

1.0 CROSS REFERENCE OF SAMPLES VERIFIED

The analytical data presented in the laboratory Sample Delivery Group (SDG) listed in Table 1 underwent an EPA Level III data validation. The Level III data validation is equivalent to a Step 2A validation, manual (S2AVM) as defined in the *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009). The SDGs contained data for the following methods.

1501 West Fountainhead Parkway, Suite 350
Tempe, AZ 85282

(480) 706-6488
fax (480) 704-2952
www.itsi.com

- Total and synthetic precipitation leaching procedure (SPLP) metals by inductively coupled plasma/atomic emission spectroscopy (ICP/AES) metals, total and dissolved, EPA Method 6010B
- Total and SPLP metals by ICP/mass spectrometry (MS) metals, total and dissolved, EPA Method 6020
- Total and SPLP mercury by cold vapor atomic absorption (CVAA) mercury EPA Method 7470A and 7471A

The primary analytical laboratory was SVL Analytical of Kellogg, Idaho. Table 1 below provides an analytical summary and cross reference for the samples.

Table 1 Analytical Summary and Sample Cross Reference
EPA Methods Total and SPLP ICP Metals and Mercury

Field Sample ID	SVL SDG	*Original SDG	Collection Date	QC
RAWTP-03 2"-1'	W8J0652-01	W802148-03	4/30/2008	PS MS/MSD
RAWTP-24 0-2"	W8J0652-02	W802122-10	4/29/2008	
RAWTP-20 0-2"	W8J0652-03	W802122-05	05/01/2008	
RAWTP-09 2"-1	W8J0652-04	W802166-09	4/30/2008	
RAWTP-18 0-2"	W8J0652-05	W802122-03	4/29/2008	
RAWTP-12 0-2"	W8J0652-06	W802119-12	4/28/2008	
RAWTP-04 0-2"	W8J0652-07	W802119-04	05/01/2008	
RAWTP-17 2"-1'	W8J0652-08	W802148-07	4/30/2008	
RAWTP-15 0-2"	W8J0652-09	W802119-14	4/30/2008	
RAWTP-10 2"-1'	W8J0652-10	W802166-13	4/30/2008	
RAWTP-04 1-2'	W8J0652-11	W802148-12	05/01/2008	
RAWTP-14 1-2'	W8J0652-12	W802167-02	4/29/2008	
RAWTP-15 1-2'	W8J0652-13	W802167-05	4/30/2008	
RAWTP-06 1-2'	W8J0652-14	W802148-18	05/01/2008	
RAWTP-18 1-2'	W8J0652-15	W802167-13	4/29/2008	
RAWTP-27 1-2'	W8J0652-16	W802168-16	4/28/2008	
RAWTP-BFD-06	W8J0652-17	W802122-06	05/01/2008	
BFD-10	W8J0652-18	W802148-10	4/30/2008	FD

*Sample was originally logged in under the SDG listed in this column. Sample was logged in later under SDG W8J0652 for analysis for the methods listed above.
FD = Field duplicate
MS/MSD = matrix spike/matrix spike duplicate
PS = Parent sample of field duplicate

2.0 LABORATORY REPORT

Quality control (QC) exceedences were indicated by the laboratory in the case narrative and data qualifier flags in the report. Any QC exceedences that required qualification of the data are addressed in Section 4.0.

3.0 SAMPLE INTEGRITY

The Chains-of-Custody (COC) for soil samples were available for review. The samples were originally received with samples from other SDGs, which are indicated in Table 1 of this Data Validation Report (DVR). There were no anomalies that required qualification of the data, however, the following COC anomaly was observed for each SDG.

- The transfer of the samples to the shipping carrier was not documented on the COC. The client indicated that the samplers shipped the samples to SVL via FedEx. ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number. A copy of the communication with the client verifying the transfer of samples to FedEx is provided in Appendix E.

4.0 DATA EVALUATION

4.1 TOTAL METALS

4.1.1 Sample Receipt and Holding Times

The samples extraction and analysis dates were reviewed against the ICP metals holding time of 180 days from collection to extraction and 180 days from extraction to analysis. The samples extraction and analysis dates were reviewed against the mercury holding time of 28 days from collection to analysis. Also, the mercury samples were reviewed against the storage criteria of less than 6°C. No storage temperature is required for the ICP metals. There were no storage anomalies observed that required qualification of the data, however, the following holding time anomalies resulted in qualification of the data.

- The total ICP metals were analyzed nine to 12 days past the recommended holding time of 180 days. The associated results have been qualified as “J” or “UJ” for an estimated value or reporting limit with a low bias.
- The total mercury samples were analyzed 166 to 169 days past holding time. The associated results which were all greater than the reporting limit, have been qualified as “J” for an estimated value with a low bias.

4.1.2 Initial and Continuing Calibration

The initial and continuing calibrations were not reviewed for this level of validation.

4.1.3 Blank Evaluation

Preparation and equipment blanks were reviewed. The equipment blank(s) associated with the samples are listed in the DVR for SDG W802216. There were no compounds detected in any of the blanks that required qualification of the data except as noted below.

- Copper was detected in the equipment (rinse) blank associated with sample RAWTP-18 1-2' at a level greater than the reporting limit. The associated result in the sample, which was greater than the blank contamination but less than 10 times the blank contamination, has been qualified as "J" for an estimated value.

4.1.4 Laboratory Control Samples

A laboratory control sample (LCS) was reported for each analysis. QC results were reviewed using the control limits listed in Table C6 of the SAP. There were no LCS anomalies that required qualification of the data.

4.1.5 Matrix Spike and Matrix Spike Duplicate

The project matrix spike/matrix spike duplicate (MS/MSD) pair was reviewed using the laboratory control limits of 75 to 125 percent for accuracy and 20 relative percent difference (RPD) for precision. The sample used as the MS/MSD pair is identified in Table 1. There were no MS/MSD anomalies that required qualification of the data except as noted below.

- The percent recovery for total antimony was out of the criteria of 65 to 135 percent at 47.7 percent and the percent recovery for total selenium was out of the criteria of 75 to 125 percent at 73.6 percent. Since the associated LCS recoveries were within criteria, only the results for antimony and selenium in the sample spiked, RAWTP-03 2"-1', were flagged "J" for an estimated value. No bias is required since the post digestive spike was within criteria.

4.1.6 Reporting Limit Spikes

Spikes prepared at the laboratory's reporting limit were reviewed. There were no reporting limit spike anomalies that required qualification of the data.

4.1.7 Compound Quantitation and Identification

The laboratory reporting limits and quantitative results were reviewed. All reporting limits and/or method detection limits met the Client Required Detection Limits (CRDLs) listed in the SAP. There were no quantitative anomalies that required qualification of the data.

4.1.8 Field Duplicate Samples

A field duplicate set was collected and analyzed to measure field and laboratory precision. The results of the field duplicate and parent samples were compared and are summarized in the Field Duplicate Table presented as Appendix D. All field duplicate results were acceptable except as noted below.

- The field duplicate relative percent differences (RPD) for the total arsenic, copper, lead and mercury were out of the criteria of less than 35. The associated results in the field duplicate set, RAWTP-03 2"-1' / BFD-10, have been qualified as "J" for an estimated value.

4.1.9 Assessment for Metals

There were no rejected results for total metals. Based on the available information, the data as qualified are considered useable for their intended purposes. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C.

4.2 SYNTHETIC PRECIPITATION LEACHING PROCEDURE METALS

4.2.1 Sample Receipt and Holding Times

The samples extraction and analysis dates were reviewed against the ICP metals holding time of 180 days from collection to synthetic precipitation leaching procedure (SPLP) extraction and 180 days from SPLP extraction to analysis. The samples extraction and analysis dates were reviewed against the mercury holding time of 28 days from collection to SPLP extraction and 28 days from SPLP extraction to analysis. Also, the mercury samples were reviewed against the storage criteria of less than 6°C. No storage temperature is required for the ICP metals. The following holding time anomalies required qualification of the data.

- The SPLP ICP metals were extracted 10 to 13 days past the recommended holding time of 180 days. The associated results have been qualified as "J" or "UJ" for an estimated value or reporting limit with a low bias.
- The SPLP mercury samples were extracted 165 to 168 days past the holding time of 28 days. The associated results greater than the reporting limit have been qualified as "J-" for an estimated value with a low bias and the non-detect results have been qualified as "R" for rejected.

4.2.2 Initial and Continuing Calibration

The initial and continuing calibrations were not reviewed for this level of validation.

4.2.3 Blank Evaluation

Preparation and equipment blanks were reviewed. The equipment blank(s) associated with the samples are listed in the DVR for SDG W802216. There were no compounds detected in any of the blanks that required qualification of the data.

4.2.4 Laboratory Control Samples

A laboratory control sample (LCS) was reported for each analysis. QC results were reviewed using the control limits listed in Table C6 of the SAP. There were no LCS anomalies that required qualification of the data.

4.2.5 Matrix Spike and Matrix Spike Duplicate

The project matrix spike/matrix spike duplicate (MS/MSD) pair was reviewed using the laboratory control limits of 75 to 125 percent for accuracy and 20 relative percent difference (RPD) for precision. The sample used as the MS/MSD pair is identified in Table 1. There were no MS/MSD anomalies that required qualification of the data.

4.2.6 Reporting Limit Spikes

Spikes prepared at the laboratory's reporting limit were reviewed. There were no reporting limit spike anomalies that required qualification of the data.

4.2.7 Compound Quantitation and Identification

The laboratory reporting limits and quantitative results were reviewed. All reporting limits or method detection limits met the Client Required Detection Limits (CRDLs) listed in the SAP except as noted below. There were no quantitative anomalies that required qualification of the data.

- The laboratory method detection limit of 0.001 mg/L SPLP extract for cadmium was greater than the practical quantitation limit of 0.0001 mg/L SPLP extract listed in the SAP. No flags are required, however, end users of the data should be aware of the higher reporting limit for cadmium for decision making purposes.
- The reporting limits for several non-detect SPLP metals were elevated due to matrix interference. No qualification of the data is required.

4.2.8 Field Duplicate Samples

A field duplicate set was collected and analyzed to measure field and laboratory precision. The results of the field duplicate and parent samples were compared and are summarized in the Field Duplicate Table presented as Appendix D. All field duplicate results were acceptable except as noted below.

- The field duplicate RPDs for SPLP antimony, arsenic and copper were out of the criteria of less than 35. The associated results in the field duplicate set, RAWTP-03 2"-1' / BFD-10, have been qualified as "J" for an estimated value.

4.2.9 Assessment for Metals

There were two rejected SPLP mercury results for the SPLP metals. Based on the available information, the other data as qualified are considered useable for their intended purposes. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C.

5.0 RECOMMENDATIONS

ITSI advises that the transfer of samples to the carrier be documented on the COC including the person relinquishing the samples, the name of the carrier, the date, the time and the air bill number.

6.0 OVERALL ASSESSMENT FOR SDG

There were two rejected SPLP mercury results for this sampling event. Based on the available information, the other qualified data are considered useable for their intended purposes. A summary of all qualified data is provided in a qualified results table (QRT) as Appendix C.

Note: Although all ICP metals were qualified as estimates due to missed holding time, Chapter 3 of *Test Methods for Evaluating Solid Waste, SW-846 Physical/Chemical Methods* (EPA, 1996) indicates that a longer holding time may be appropriate if it can be demonstrated that the reported analyte concentrations are not adversely affected by preservation, storage and analyses performed outside the recommended holding times. The client may deem the ICP data usable without holding time qualifications if the sample integrity can be demonstrated.

We thank you for the opportunity to serve you and look forward to supporting RCM with data review in the future.

Sincerely,

Innovative Technical Solutions, Inc.

Evelyn H. Dawson, CHMM
Senior Chemist

Enclosures:

Appendix A – List of Acronyms and Abbreviations
Appendix B – Qualified Report Pages
Appendix C – Qualified Results Table
Appendix D – Field Duplicate Table
Appendix E – Client Communication
Appendix F – ITSI Standard Legal Notice

cc: John Malusa
Golder Associates, Inc.
4730 North Oracle Road, Suite 210
Tucson, Arizona, 85705

APPENDIX A

LIST OF ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS AND ABBREVIATIONS

COC	chain-of-custody
CRQL	Contract Required Quantitation Limit
AA	atomic absorption
AES	atomic emission spectroscopy
CRI	Contract Required Quantitation Limit Check Standard
CVAA	cold vapor atomic absorption
EPA	U.S. Environmental Protection Agency
HHRA	Human Health Risk Assessment
ICP	inductively coupled plasma
ITSI	Innovative Technical Solutions, Inc.
LCS	laboratory control samples
MDL	method detection limit
MS	mass spectrometry
MS/MSD	matrix spike/matrix spike duplicate
PQL	practical quantitation limit
QAPP	Quality Assurance Project Plan
QC	quality control
QRT	qualified results table
RCM	Resolution Copper Mining
RPD	relative percent difference
SDG	Sample Delivery Group
SPLP	synthetic leaching precipitation procedure
SVL	SVL Analytical

APPENDIX B

QUALIFIED REPORT PAGES

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-03 2''-1'**
SVL Sample ID: **W8J0652-01 (Solid)**

Sampled: 30-Apr-08 08:35
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	2.3 J-	mg/kg	2.0	0.4		W845130	DT	11/10/08 11:14	H3
EPA 6010B	**Arsenic**	98.5	mg/kg	2.5	0.7		W845130	DT	11/10/08 11:14	H3
EPA 6010B	**Barium**	90.6	mg/kg	0.20	0.04		W845130	DT	11/10/08 11:13	H3
EPA 6010B	**Beryllium**	0.416	mg/kg	0.200	0.025		W845130	DT	11/10/08 11:12	H3
EPA 6010B	**Cadmium**	0.53	mg/kg	0.20	0.05		W845130	DT	11/10/08 11:13	H3
EPA 6010B	**Chromium**	11.4	mg/kg	0.60	0.11		W845130	DT	11/10/08 11:13	H3
EPA 6010B	**Copper**	2190	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 09:27	D2,H3
EPA 6010B	**Lead**	51.3	mg/kg	0.75	0.25		W845130	DT	11/10/08 11:14	H3
EPA 6010B	**Nickel**	18.7	mg/kg	1.00	0.19		W845130	DT	11/10/08 11:13	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 11:14	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 11:14	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.430 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 01:39	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.25	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.004 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 05:05	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 05:04	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 05:05	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 05:05	H3
EPA 6010B	**Copper**	0.13 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 05:05	H3
EPA 6010B	Lead	< 0.0075 UJ-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 05:05	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 05:05	H3
EPA 6020	**Antimony**	0.0069 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:04	D1,H3
EPA 6020	**Arsenic**	0.340 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:04	D2,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:04	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:04	D1,H3
EPA 7470A	**Mercury**	0.0011 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:41	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

SVL ANALYTICAL
One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-24 0-2"**
SVL Sample ID: **W8J0652-02 (Solid)**

Sampled: 29-Apr-08 08:50
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	3.1 J-	mg/kg	2.0	0.4		W845130	DT	11/10/08 11:32	H3
EPA 6010B	**Arsenic**	157	mg/kg	2.5	0.7		W845130	DT	11/10/08 11:32	H3
EPA 6010B	**Barium**	82.7	mg/kg	0.20	0.04		W845130	DT	11/10/08 11:31	H3
EPA 6010B	**Beryllium**	0.456	mg/kg	0.200	0.025		W845130	DT	11/10/08 11:30	H3
EPA 6010B	**Cadmium**	0.53	mg/kg	0.20	0.05		W845130	DT	11/10/08 11:31	H3
EPA 6010B	**Chromium**	9.83	mg/kg	0.60	0.11		W845130	DT	11/10/08 11:32	H3
EPA 6010B	**Copper**	1880	mg/kg	1.00	0.29		W845130	DT	11/10/08 11:31	H3
EPA 6010B	**Lead**	110	mg/kg	0.75	0.25		W845130	DT	11/10/08 11:32	H3
EPA 6010B	**Nickel**	10.1	mg/kg	1.00	0.19		W845130	DT	11/10/08 11:31	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 11:32	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 11:32	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.263 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 01:47	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.14	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.004 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 05:23	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 05:21	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 05:23	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 05:23	H3
EPA 6010B	**Copper**	0.11 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 05:22	H3
EPA 6010B	**Lead**	0.0079 J-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 05:23	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 05:23	H3
EPA 6020	**Antimony**	0.0031 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:12	D1,H3
EPA 6020	**Arsenic**	0.070 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:12	D1,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:12	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:12	D1,H3
EPA 7470A	**Mercury**	0.0022 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:46	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

SVL ANALYTICAL
One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-20 0-2"**
SVL Sample ID: **W8J0652-03 (Solid)**

Sampled: 01-May-08 13:05
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	4.0 J-	mg/kg	2.0	0.4		W845130	DT	11/10/08 11:37	H3
EPA 6010B	**Arsenic**	144	mg/kg	2.5	0.7		W845130	DT	11/10/08 11:37	H3
EPA 6010B	**Barium**	78.8	mg/kg	0.20	0.04		W845130	DT	11/10/08 11:37	H3
EPA 6010B	**Beryllium**	0.362	mg/kg	0.200	0.025		W845130	DT	11/10/08 11:36	H3
EPA 6010B	**Cadmium**	0.30	mg/kg	0.20	0.05		W845130	DT	11/10/08 11:37	H3
EPA 6010B	**Chromium**	5.41	mg/kg	0.60	0.11		W845130	DT	11/10/08 11:37	H3
EPA 6010B	**Copper**	2210	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 09:56	D2,H3
EPA 6010B	**Lead**	143	mg/kg	0.75	0.25		W845130	DT	11/10/08 11:37	H3
EPA 6010B	**Nickel**	5.54	mg/kg	1.00	0.19		W845130	DT	11/10/08 11:37	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 11:37	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 11:37	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.775 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 01:48	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.72	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.02 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 05:28	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 05:27	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 05:28	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 05:28	H3
EPA 6010B	**Copper**	0.46 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 05:28	H3
EPA 6010B	**Lead**	0.0180 J-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 05:28	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 05:28	H3
EPA 6020	**Antimony**	0.0125 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:14	D1,H3
EPA 6020	**Arsenic**	0.254 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:14	D2,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:14	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:14	D1,H3
EPA 7470A	**Mercury**	0.0003 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:51	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-09 2"-1**
SVL Sample ID: **W8J0652-04 (Solid)**

Sampled: 30-Apr-08 13:40
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	4.7 J-	mg/kg	2.0	0.4		W845130	DT	11/10/08 11:49	H3
EPA 6010B	**Arsenic**	355	mg/kg	2.5	0.7		W845130	DT	11/10/08 11:49	H3
EPA 6010B	**Barium**	89.9	mg/kg	0.20	0.04		W845130	DT	11/10/08 11:49	H3
EPA 6010B	**Beryllium**	0.480	mg/kg	0.200	0.025		W845130	DT	11/10/08 11:47	H3
EPA 6010B	**Cadmium**	1.88	mg/kg	0.20	0.05		W845130	DT	11/10/08 11:49	H3
EPA 6010B	**Chromium**	23.1	mg/kg	0.60	0.11		W845130	DT	11/10/08 11:49	H3
EPA 6010B	**Copper**	6410	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 10:02	D2,H3
EPA 6010B	**Lead**	161	mg/kg	0.75	0.25		W845130	DT	11/10/08 11:49	H3
EPA 6010B	**Nickel**	25.2	mg/kg	1.00	0.19		W845130	DT	11/10/08 11:49	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 11:49	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 11:49	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.232 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 01:50	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.93	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.02 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 05:34	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 05:33	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 05:34	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 05:34	H3
EPA 6010B	**Copper**	0.67 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 05:34	H3
EPA 6010B	**Lead**	0.0138 J-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 05:34	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 05:34	H3
EPA 6020	**Antimony**	0.0149 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:17	H3,D1
EPA 6020	**Arsenic**	0.597 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:17	D2,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:17	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:17	D1,H3
EPA 7470A	**Mercury**	0.0039 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:52	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

SVL ANALYTICAL
One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-18 0-2"**
SVL Sample ID: **W8J0652-05 (Solid)**

Sampled: 29-Apr-08 09:45
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	8.4 J-	mg/kg	2.0	0.4		W845130	DT	11/10/08 11:55	H3
EPA 6010B	**Arsenic**	567	mg/kg	2.5	0.7		W845130	DT	11/10/08 11:55	H3
EPA 6010B	**Barium**	117	mg/kg	0.20	0.04		W845130	DT	11/10/08 11:55	H3
EPA 6010B	**Beryllium**	0.423	mg/kg	0.200	0.025		W845130	DT	11/10/08 11:53	H3
EPA 6010B	**Cadmium**	1.83	mg/kg	0.20	0.05		W845130	DT	11/10/08 11:55	H3
EPA 6010B	**Chromium**	8.02	mg/kg	0.60	0.11		W845130	DT	11/10/08 11:55	H3
EPA 6010B	**Copper**	13300	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 10:07	D2,H3
EPA 6010B	**Lead**	264	mg/kg	0.75	0.25		W845130	DT	11/10/08 11:55	H3
EPA 6010B	**Nickel**	12.2	mg/kg	1.00	0.19		W845130	DT	11/10/08 11:55	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 11:55	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 11:55	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.573 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 01:52	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.87	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.02 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 05:40	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 05:38	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 05:40	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 05:40	H3
EPA 6010B	**Copper**	0.49 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 05:39	H3
EPA 6010B	Lead	< 0.0075 UJ-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 05:40	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 05:40	H3
EPA 6020	**Antimony**	0.0163 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:19	D1,H3
EPA 6020	**Arsenic**	0.595 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:19	D2,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:19	H3,D1
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:19	D1,H3
EPA 7470A	**Mercury**	0.0006 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:54	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

SVL ANALYTICAL
One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-12 0-2"**
SVL Sample ID: **W8J0652-06 (Solid)**

Sampled: 28-Apr-08 15:25
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	11.2 J-	mg/kg	2.0	0.4		W845130	DT	11/10/08 12:49	H3
EPA 6010B	**Arsenic**	949	mg/kg	2.5	0.7		W845130	DT	11/10/08 12:49	H3
EPA 6010B	**Barium**	112	mg/kg	0.20	0.04		W845130	DT	11/10/08 12:48	H3
EPA 6010B	**Beryllium**	0.415	mg/kg	0.200	0.025		W845130	DT	11/10/08 12:46	H3
EPA 6010B	**Cadmium**	4.65	mg/kg	0.20	0.05		W845130	DT	11/10/08 12:48	H3
EPA 6010B	**Chromium**	20.8	mg/kg	0.60	0.11		W845130	DT	11/10/08 12:49	H3
EPA 6010B	**Copper**	18800	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 10:13	D2,H3
EPA 6010B	**Lead**	489	mg/kg	0.75	0.25		W845130	DT	11/10/08 12:48	H3
EPA 6010B	**Nickel**	26.2	mg/kg	1.00	0.19		W845130	DT	11/10/08 12:48	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 12:49	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 12:49	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.978 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 01:53	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.18	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.02 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 05:46	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 05:44	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 05:46	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 05:46	H3
EPA 6010B	**Copper**	2.74 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 05:45	H3
EPA 6010B	**Lead**	0.117 J-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 05:46	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 05:46	H3
EPA 6020	**Antimony**	0.0223 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:31	D1,H3
EPA 6020	**Arsenic**	0.767 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:31	D2,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:31	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:31	H3,D1
EPA 7470A	**Mercury**	0.0025 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:56	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

SVL ANALYTICAL
One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-04 0-2"**
SVL Sample ID: **W8J0652-07 (Solid)**

Sampled: 01-May-08 11:15
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	16.0 J-	mg/kg	2.0	0.4		W845130	DT	11/10/08 12:55	H3
EPA 6010B	**Arsenic**	1070	mg/kg	2.5	0.7		W845130	DT	11/10/08 12:55	H3
EPA 6010B	**Barium**	124	mg/kg	0.20	0.04		W845130	DT	11/10/08 12:55	H3
EPA 6010B	**Beryllium**	0.583	mg/kg	0.200	0.025		W845130	DT	11/10/08 12:53	H3
EPA 6010B	**Cadmium**	5.78	mg/kg	0.20	0.05		W845130	DT	11/10/08 12:55	H3
EPA 6010B	**Chromium**	11.4	mg/kg	0.60	0.11		W845130	DT	11/10/08 12:55	H3
EPA 6010B	**Copper**	50100	mg/kg	100	29.0	100	W845130	DG	11/14/08 11:12	D2,H3
EPA 6010B	**Lead**	448	mg/kg	0.75	0.25		W845130	DT	11/10/08 12:55	H3
EPA 6010B	**Nickel**	20.6	mg/kg	1.00	0.19		W845130	DT	11/10/08 12:55	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 12:55	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 12:55	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	2.92 J-	mg/kg	0.330	0.097	10	W845164	JAA	11/11/08 02:56	D2,H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.86	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.03 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:03	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:01	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:03	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:03	H3
EPA 6010B	**Copper**	0.97 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:02	H3
EPA 6010B	**Lead**	0.0264 J-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:03	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:03	H3
EPA 6020	**Antimony**	0.0163 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:33	D1,H3
EPA 6020	**Arsenic**	1.63 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:33	D2,H3
EPA 6020	**Selenium**	0.0031 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:33	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:33	D1,H3
EPA 7470A	**Mercury**	0.0012 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:58	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-17 2"-1'**
SVL Sample ID: **W8J0652-08 (Solid)**

Sampled: 30-Apr-08 09:25
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	16.0 J-	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:02	H3
EPA 6010B	**Arsenic**	1520	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:02	H3
EPA 6010B	**Barium**	129	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:02	H3
EPA 6010B	**Beryllium**	0.469	mg/kg	0.200	0.025		W845130	DT	11/10/08 12:59	H3
EPA 6010B	**Cadmium**	3.78	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:02	H3
EPA 6010B	**Chromium**	6.27	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:02	H3
EPA 6010B	**Copper**	27900	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 10:50	D2,H3
EPA 6010B	**Lead**	457	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:02	H3
EPA 6010B	**Nickel**	15.8	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:02	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:02	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:02	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	1.95 J-	mg/kg	0.330	0.097	10	W845164	JAA	11/11/08 02:57	D2,H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	7.87	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.02 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:09	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:07	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:09	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:09	H3
EPA 6010B	**Copper**	0.15 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:08	H3
EPA 6010B	Lead	< 0.0075 UJ-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:09	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:09	H3
EPA 6020	**Antimony**	0.0242 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:35	D1,H3
EPA 6020	**Arsenic**	0.236 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:35	D2,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:35	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:35	D1,H3
EPA 7470A	**Mercury**	0.0056 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 04:59	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-15 0-2"**
SVL Sample ID: **W8J0652-09 (Solid)**

Sampled: 30-Apr-08 11:55
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	5.3 J-	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Arsenic**	385	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Barium**	95.8	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Beryllium**	0.365	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:06	H3
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Chromium**	13.3	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Copper**	1200	mg/kg	1.00	0.29		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Lead**	161	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:08	H3
EPA 6010B	**Nickel**	10.7	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:08	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:08	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:08	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.508 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:02	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	5.58	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.03 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:14	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:13	H3
EPA 6010B	**Cadmium**	0.002 J-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:14	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:14	H3
EPA 6010B	**Copper**	1.97 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:14	H3
EPA 6010B	Lead	< 0.0075 UJ-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:14	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:14	H3
EPA 6020	Antimony	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:37	D1,H3
EPA 6020	**Arsenic**	0.008 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:37	D1,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:37	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:37	D1,H3
EPA 7470A	Mercury	< 0.0002 R	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:01	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-10 2"-1'**
SVL Sample ID: **W8J0652-10 (Solid)**

Sampled: 30-Apr-08 07:40
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	6.7 J-	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:14	H3
EPA 6010B	**Arsenic**	559	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:14	H3
EPA 6010B	**Barium**	125	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:14	H3
EPA 6010B	**Beryllium**	0.507	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:12	H3
EPA 6010B	**Cadmium**	1.99	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:14	H3
EPA 6010B	**Chromium**	8.34	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:14	H3
EPA 6010B	**Copper**	13800	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 10:55	D2,H3
EPA 6010B	**Lead**	187	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:14	H3
EPA 6010B	**Nickel**	13.6	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:14	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:14	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:14	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.540 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:03	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	6.91	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.04 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:20	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:19	H3
EPA 6010B	**Cadmium**	0.004 J-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:20	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:20	H3
EPA 6010B	**Copper**	2.12 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:20	H3
EPA 6010B	Lead	< 0.0075 UJ-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:20	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:20	H3
EPA 6020	**Antimony**	0.0257 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:39	D1,H3
EPA 6020	**Arsenic**	1.44 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:39	D2,H3
EPA 6020	**Selenium**	0.0049 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:39	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:39	D1,H3
EPA 7470A	**Mercury**	0.0026 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:02	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

SVL ANALYTICAL
One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-04 1-2'**
SVL Sample ID: **W8J0652-11 (Solid)**

Sampled: 01-May-08 11:35
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	3.6 J-	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:21	H3
EPA 6010B	**Arsenic**	185	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:21	H3
EPA 6010B	**Barium**	128	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:21	H3
EPA 6010B	**Beryllium**	0.528	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:19	H3
EPA 6010B	**Cadmium**	1.00	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:21	H3
EPA 6010B	**Chromium**	11.7	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:21	H3
EPA 6010B	**Copper**	8560	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 11:01	D2,H3
EPA 6010B	**Lead**	71.9	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:21	H3
EPA 6010B	**Nickel**	17.1	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:21	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:21	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:21	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.445 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:05	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.05	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.01 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:26	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:24	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:26	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:26	H3
EPA 6010B	**Copper**	0.09 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:25	H3
EPA 6010B	Lead	< 0.0075 UJ-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:26	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:26	H3
EPA 6020	**Antimony**	0.0116 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:41	D1,H3
EPA 6020	**Arsenic**	0.985 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:41	D2,H3
EPA 6020	**Selenium**	0.0031 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:41	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:41	D1,H3
EPA 7470A	**Mercury**	0.0037 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:04	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-14 1-2'**
SVL Sample ID: **W8J0652-12 (Solid)**

Sampled: 29-Apr-08 14:40
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0 UJ-	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Arsenic**	99.6 J-	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Barium**	95.2	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Beryllium**	0.637	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:25	H3
EPA 6010B	**Cadmium**	0.20	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Chromium**	4.71	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Copper**	702	mg/kg	1.00	0.29		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Lead**	17.9	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:27	H3
EPA 6010B	**Nickel**	12.0	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:27	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:27	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:27	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.415 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:10	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.26	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.03 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:31	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:30	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:31	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:31	H3
EPA 6010B	**Copper**	0.27 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:31	H3
EPA 6010B	**Lead**	0.0076 J-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:31	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:31	H3
EPA 6020	**Antimony**	0.0214 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:44	D1,H3
EPA 6020	**Arsenic**	0.404 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:44	D2,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:44	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:44	D1,H3
EPA 7470A	**Mercury**	0.0006 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:06	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-15 1-2'**
SVL Sample ID: **W8J0652-13 (Solid)**

Sampled: 30-Apr-08 12:20
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	2.5 J-	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:33	H3
EPA 6010B	**Arsenic**	104	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:33	H3
EPA 6010B	**Barium**	145	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:33	H3
EPA 6010B	**Beryllium**	0.908	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:31	H3
EPA 6010B	Cadmium	< 0.20 UJ-	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:33	H3
EPA 6010B	**Chromium**	9.67 J-	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:33	H3
EPA 6010B	**Copper**	948	mg/kg	1.00	0.29		W845130	DT	11/10/08 01:32	H3
EPA 6010B	**Lead**	43.7	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:33	H3
EPA 6010B	**Nickel**	15.2	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:33	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:33	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:33	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.133 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:11	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.67	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.02 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:37	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:36	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:37	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:37	H3
EPA 6010B	**Copper**	0.12 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:37	H3
EPA 6010B	Lead	< 0.0075 UJ-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:37	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:37	H3
EPA 6020	**Antimony**	0.0042 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:46	D1,H3
EPA 6020	**Arsenic**	0.104 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:46	D2,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:46	H3,D1
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:46	D1,H3
EPA 7470A	**Mercury**	0.0002 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:11	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-06 1-2'**
SVL Sample ID: **W8J0652-14 (Solid)**

Sample Report Page 1 of 1

Sampled: 01-May-08 08:15
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0 UJ-	mg/kg	2.0	0.4		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Arsenic**	69.3 J-	mg/kg	2.5	0.7		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Barium**	113 J-	mg/kg	0.20	0.04		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Beryllium**	0.260 J-	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:38	H3
EPA 6010B	Cadmium	< 0.20 UJ-	mg/kg	0.20	0.05		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Chromium**	12.8 J-	mg/kg	0.60	0.11		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Copper**	417	mg/kg	1.00	0.29		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Lead**	14.2	mg/kg	0.75	0.25		W845130	DT	11/10/08 01:39	H3
EPA 6010B	**Nickel**	16.4	mg/kg	1.00	0.19		W845130	DT	11/10/08 01:39	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 01:39	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 01:39	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.065 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:13	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.04	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.007 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:43	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:41	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:43	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:43	H3
EPA 6010B	**Copper**	0.02 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:43	H3
EPA 6010B	Lead	< 0.0075 UJ-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:43	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:43	H3
EPA 6020	**Antimony**	0.0137 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:48	D1,H3
EPA 6020	**Arsenic**	0.552 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:48	D2,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:48	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:48	D1,H3
EPA 7470A	Mercury	< 0.0002 R	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:12	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-18 1-2'**
SVL Sample ID: **W8J0652-15 (Solid)**

Sampled: 29-Apr-08 10:10
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0 UJ-	mg/kg	2.0	0.4		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Arsenic**	15.7 J-	mg/kg	2.5	0.7		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Barium**	82.8 J-	mg/kg	0.20	0.04		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Beryllium**	0.479 J-	mg/kg	0.200	0.025		W845130	DT	11/10/08 01:59	H3
EPA 6010B	Cadmium	< 0.20 UJ-	mg/kg	0.20	0.05		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Chromium**	5.02 J-	mg/kg	0.60	0.11		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Copper**	52.2 J-	mg/kg	1.00	0.29		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Lead**	7.83 J-	mg/kg	0.75	0.25		W845130	DT	11/10/08 02:00	H3
EPA 6010B	**Nickel**	8.65 J-	mg/kg	1.00	0.19		W845130	DT	11/10/08 02:00	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 02:00	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 02:00	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.055 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:15	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.28	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.008 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:49	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:47	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:49	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:49	H3
EPA 6010B	**Copper**	0.03 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:48	H3
EPA 6010B	Lead	< 0.0075 UJ-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:49	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:49	H3
EPA 6020	Antimony	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:55	D1,H3
EPA 6020	**Arsenic**	0.076 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:55	D1,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:55	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:55	D1,H3
EPA 7470A	**Mercury**	0.0004 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:14	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-27 1-2'**
SVL Sample ID: **W8J0652-16 (Solid)**

Sampled: 28-Apr-08 13:55
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0 UJ-	mg/kg	2.0	0.4		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Arsenic**	58.1 J-	mg/kg	2.5	0.7		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Barium**	81.3 J-	mg/kg	0.20	0.04		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Beryllium**	0.546 J-	mg/kg	0.200	0.025		W845130	DT	11/10/08 02:04	H3
EPA 6010B	Cadmium	< 0.20 UJ-	mg/kg	0.20	0.05		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Chromium**	3.45 J-	mg/kg	0.60	0.11		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Copper**	492	mg/kg	1.00	0.29		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Lead**	16.7	mg/kg	0.75	0.25		W845130	DT	11/10/08 02:06	H3
EPA 6010B	**Nickel**	7.95	mg/kg	1.00	0.19		W845130	DT	11/10/08 02:06	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 02:06	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 02:06	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.163 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:16	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	8.57	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.004 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 06:54	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 06:53	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 06:54	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 06:54	H3
EPA 6010B	**Copper**	0.08 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 06:54	H3
EPA 6010B	Lead	< 0.0075 UJ-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 06:54	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 06:54	H3
EPA 6020	**Antimony**	0.0039 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:57	D1,H3
EPA 6020	**Arsenic**	0.314 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 07:57	D2,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 07:57	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 07:57	D1,H3
EPA 7470A	**Mercury**	0.0006 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:16	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **RAWTP-BFD-06**
SVL Sample ID: **W8J0652-17 (Solid)**

Sampled: 01-May-08 00:00
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	3.7 J-	mg/kg	2.0	0.4		W845130	DT	11/10/08 02:12	H3
EPA 6010B	**Arsenic**	133	mg/kg	2.5	0.7		W845130	DT	11/10/08 02:12	H3
EPA 6010B	**Barium**	78.0	mg/kg	0.20	0.04		W845130	DT	11/10/08 02:12	H3
EPA 6010B	**Beryllium**	0.361	mg/kg	0.200	0.025		W845130	DT	11/10/08 02:10	H3
EPA 6010B	**Cadmium**	0.34	mg/kg	0.20	0.05		W845130	DT	11/10/08 02:12	H3
EPA 6010B	**Chromium**	4.29	mg/kg	0.60	0.11		W845130	DT	11/10/08 02:12	H3
EPA 6010B	**Copper**	2710	mg/kg	10.0	2.90	10	W845130	DG	11/14/08 11:07	D2,H3
EPA 6010B	**Lead**	143	mg/kg	0.75	0.25		W845130	DT	11/10/08 02:12	H3
EPA 6010B	**Nickel**	5.90	mg/kg	1.00	0.19		W845130	DT	11/10/08 02:12	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 02:12	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 02:12	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.623 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:18	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	7.99	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.03 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 07:11	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 07:10	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 07:11	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 07:11	H3
EPA 6010B	**Copper**	0.76 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 07:11	H3
EPA 6010B	**Lead**	0.0373 J-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 07:11	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 07:11	H3
EPA 6020	**Antimony**	0.0171 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 08:00	D1,H3
EPA 6020	**Arsenic**	0.310 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 08:00	H3,D2
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 08:00	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 08:00	D1,H3
EPA 7470A	**Mercury**	0.0008 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:17	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Golder Associates (AZ)
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705

Work Order: **W8J0652**
Reported: 14-Nov-08 15:45

Client Sample ID: **BFD-10**
SVL Sample ID: **W8J0652-18 (Solid)**

Sampled: 30-Apr-08 08:41
Received: 27-Oct-08
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0 UJ-	mg/kg	2.0	0.4		W845130	DT	11/10/08 02:18	H3
EPA 6010B	**Arsenic**	34.7 J-	mg/kg	2.5	0.7		W845130	DT	11/10/08 02:18	H3
EPA 6010B	**Barium**	87.6 J-	mg/kg	0.20	0.04		W845130	DT	11/10/08 02:18	H3
EPA 6010B	**Beryllium**	0.372 J-	mg/kg	0.200	0.025		W845130	DT	11/10/08 02:16	H3
EPA 6010B	Cadmium	< 0.20 UJ-	mg/kg	0.20	0.05		W845130	DT	11/10/08 02:18	H3
EPA 6010B	**Chromium**	9.94 J-	mg/kg	0.60	0.11		W845130	DT	11/10/08 02:18	H3
EPA 6010B	**Copper**	613	mg/kg	1.00	0.29		W845130	DT	11/10/08 02:17	H3
EPA 6010B	**Lead**	19.1	mg/kg	0.75	0.25		W845130	DT	11/10/08 02:18	H3
EPA 6010B	**Nickel**	19.8	mg/kg	1.00	0.19		W845130	DT	11/10/08 02:18	H3
EPA 6010B	Selenium	< 4.0 UJ-	mg/kg	4.0	1.1		W845130	DT	11/10/08 02:18	H3
EPA 6010B	Thallium	< 1.5 UJ-	mg/kg	1.5	0.3		W845130	DT	11/10/08 02:18	H3
Mercury by SW846 Methods										
EPA 7471A	**Mercury**	0.162 J-	mg/kg	0.033	0.010		W845164	JAA	11/11/08 02:20	H3
SPLP Extraction Parameters										
ASTM E2242-02	**Extraction Time**	18.0	Hrs				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Extraction Volume**	2000	mL				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Final Fluid pH**	9.26	pH Units				W844132	ESB	11/03/08 09:50	
ASTM E2242-02	Fluid Type	Western					W844132	ESB	11/03/08 09:50	
ASTM E2242-02	**Sample Weight**	100	g				W844132	ESB	11/03/08 09:50	
SPLP Leachates (Metals)										
EPA 6010B	**Barium**	0.004 J-	mg/L Extract	0.002	0.0005		W845052	AS	11/10/08 07:17	H3
EPA 6010B	Beryllium	< 0.002 UJ-	mg/L Extract	0.002	0.0004		W845052	AS	11/10/08 07:16	H3
EPA 6010B	Cadmium	< 0.002 UJ-	mg/L Extract	0.002	0.001		W845052	AS	11/10/08 07:17	H3
EPA 6010B	Chromium	< 0.006 UJ-	mg/L Extract	0.006	0.001		W845052	AS	11/10/08 07:17	H3
EPA 6010B	**Copper**	0.07 J-	mg/L Extract	0.01	0.004		W845052	AS	11/10/08 07:17	H3
EPA 6010B	Lead	< 0.0075 UJ-	mg/L Extract	0.0075	0.0039		W845052	AS	11/10/08 07:17	H3
EPA 6010B	Nickel	< 0.01 UJ-	mg/L Extract	0.01	0.002		W845052	AS	11/10/08 07:17	H3
EPA 6020	**Antimony**	0.0038 J-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 08:02	H3,D1
EPA 6020	**Arsenic**	0.222 J-	mg/L Extract	0.004	0.0007	5	W845038	KWH	11/11/08 08:02	D2,H3
EPA 6020	Selenium	< 0.0030 UJ-	mg/L Extract	0.0030	0.0005	5	W845038	KWH	11/11/08 08:02	D1,H3
EPA 6020	Thallium	< 0.001 UJ-	mg/L Extract	0.001	0.00009	5	W845038	KWH	11/11/08 08:02	D1,H3
EPA 7470A	**Mercury**	0.0008 J-	mg/L Extract	0.0002	0.00008		W846032	HB	11/10/08 05:19	H3

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director

PGC ITSI
06Oct2011

APPENDIX C

QUALIFIED RESULTS TABLE

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Fraction	Parameter	Original Value	Added Qualifier	New Value	MDL	PQL	Units	Reason
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Barium	0.004	J-	0.004 J-	0.0005	0.002	mg/L	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Copper	0.13	J-	0.13 J-	0.004	0.01	mg/L	HT/RPD FD
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Lead	ND	UJ-	0.0075 UJ-	0.0039	0.0075	mg/L	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6020	SPLP	Antimony	0.0069	J-	0.0069 J-	0.0005	0.003	mg/L	HT/RPD FD
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6020	SPLP	Arsenic	0.340	J-	0.340 J-	0.0007	0.004	mg/L	HT/RPD FD
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 7470A	SPLP	Mercury	0.0011	J-	0.0011 J-	0.00008	0.0002	mg/L	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Antimony	2.3	J-	2.3 J-	0.4	2	mg/kg	HT/%R MS
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Arsenic	98.5	J-	98.5 J-	0.7	2.5	mg/kg	HT/RPD FD
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Barium	90.6	J-	90.6 J-	0.04	0.2	mg/kg	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Beryllium	0.416	J-	0.416 J-	0.025	0.2	mg/kg	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Cadmium	0.53	J-	0.53 J-	0.05	0.2	mg/kg	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Chromium	11.4	J-	11.4 J-	0.11	0.6	mg/kg	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Copper	2190	J-	2190 J-	2.9	10	mg/kg	HT/RPD FD
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Lead	51.3	J-	51.3 J-	0.25	0.75	mg/kg	HT/RPD FD
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Nickel	18.7	J-	18.7 J-	0.19	1	mg/kg	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT/%R MS
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-01	RAWTP-03 2"-1'	4/30/2008	Soil	EPA 7471A	Total	Mercury	0.430	J-	0.430 J-	0.01	0.033	mg/kg	HT/RPD FD
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Barium	0.004	J-	0.004 J-	0.0005	0.002	mg/L	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Copper	0.11	J-	0.11 J-	0.004	0.01	mg/L	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Lead	0.0079	J-	0.0079 J-	0.0039	0.0075	mg/L	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6020	SPLP	Antimony	0.0031	J-	0.0031 J-	0.0005	0.003	mg/L	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6020	SPLP	Arsenic	0.070	J-	0.070 J-	0.0007	0.004	mg/L	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 7470A	SPLP	Mercury	0.0022	J-	0.0022 J-	0.00008	0.0002	mg/L	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	Total	Antimony	3.1	J-	3.1 J-	0.4	2	mg/kg	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	Total	Arsenic	157	J-	157 J-	0.7	2.5	mg/kg	HT

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Fraction	Parameter	Original Value	Added Qualifier	New Value	MDL	PQL	Units	Reason
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	Total	Barium	82.7	J-	82.7 J-	0.04	0.2	mg/kg	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	Total	Beryllium	0.456	J-	0.456 J-	0.025	0.2	mg/kg	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	Total	Cadmium	0.53	J-	0.53 J-	0.05	0.2	mg/kg	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	Total	Chromium	9.83	J-	9.83 J-	0.11	0.6	mg/kg	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	Total	Copper	1880	J-	1880 J-	0.29	1	mg/kg	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	Total	Lead	110	J-	110 J-	0.25	0.75	mg/kg	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	Total	Nickel	10.1	J-	10.1 J-	0.19	1	mg/kg	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-02	RAWTP-24 0-2"	4/29/2008	Soil	EPA 7471A	Total	Mercury	0.263	J-	0.263 J-	0.01	0.033	mg/kg	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Barium	0.02	J-	0.02 J-	0.0005	0.002	mg/L	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Copper	0.46	J-	0.46 J-	0.004	0.01	mg/L	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Lead	0.0180	J-	0.0180 J-	0.0039	0.0075	mg/L	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6020	SPLP	Antimony	0.0125	J-	0.0125 J-	0.0005	0.003	mg/L	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6020	SPLP	Arsenic	0.254	J-	0.254 J-	0.0007	0.004	mg/L	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 7470A	SPLP	Mercury	0.0003	J-	0.0003 J-	0.00008	0.0002	mg/L	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	Total	Antimony	4.0	J-	4.0 J-	0.4	2	mg/kg	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	Total	Arsenic	144	J-	144 J-	0.7	2.5	mg/kg	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	Total	Barium	78.8	J-	78.8 J-	0.04	0.2	mg/kg	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	Total	Beryllium	0.362	J-	0.362 J-	0.025	0.2	mg/kg	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	Total	Cadmium	0.30	J-	0.30 J-	0.05	0.2	mg/kg	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	Total	Chromium	5.41	J-	5.41 J-	0.11	0.6	mg/kg	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	Total	Copper	2210	J-	2210 J-	2.9	10	mg/kg	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	Total	Lead	143	J-	143 J-	0.25	0.75	mg/kg	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	Total	Nickel	5.54	J-	5.54 J-	0.19	1	mg/kg	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-03	RAWTP-20 0-2"	5/1/2008	Soil	EPA 7471A	Total	Mercury	0.775	J-	0.775 J-	0.01	0.033	mg/kg	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	SPLP	Barium	0.02	J-	0.02 J-	0.0005	0.002	mg/L	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Fraction	Parameter	Original Value	Added Qualifier	New Value	MDL	PQL	Units	Reason
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	SPLP	Copper	0.67	J-	0.67 J-	0.004	0.01	mg/L	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	SPLP	Lead	0.0138	J-	0.0138 J-	0.0039	0.0075	mg/L	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6020	SPLP	Antimony	0.0149	J-	0.0149 J-	0.0005	0.003	mg/L	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6020	SPLP	Arsenic	0.597	J-	0.597 J-	0.0007	0.004	mg/L	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 7470A	SPLP	Mercury	0.0039	J-	0.0039 J-	0.00008	0.0002	mg/L	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	Total	Antimony	4.7	J-	4.7 J-	0.4	2	mg/kg	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	Total	Arsenic	355	J-	355 J-	0.7	2.5	mg/kg	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	Total	Barium	89.9	J-	89.9 J-	0.04	0.2	mg/kg	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	Total	Beryllium	0.480	J-	0.480 J-	0.025	0.2	mg/kg	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	Total	Cadmium	1.88	J-	1.88 J-	0.05	0.2	mg/kg	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	Total	Chromium	23.1	J-	23.1 J-	0.11	0.6	mg/kg	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	Total	Copper	6410	J-	6410 J-	2.9	10	mg/kg	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	Total	Lead	161	J-	161 J-	0.25	0.75	mg/kg	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	Total	Nickel	25.2	J-	25.2 J-	0.19	1	mg/kg	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-04	RAWTP-09 2"-1	4/30/2008	Soil	EPA 7471A	Total	Mercury	0.232	J-	0.232 J-	0.01	0.033	mg/kg	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Barium	0.02	J-	0.02 J-	0.0005	0.002	mg/L	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Copper	0.49	J-	0.49 J-	0.004	0.01	mg/L	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Lead	ND	UJ-	0.0075 UJ-	0.0039	0.0075	mg/L	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6020	SPLP	Antimony	0.0163	J-	0.0163 J-	0.0005	0.003	mg/L	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6020	SPLP	Arsenic	0.595	J-	0.595 J-	0.0007	0.004	mg/L	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 7470A	SPLP	Mercury	0.0006	J-	0.0006 J-	0.00008	0.0002	mg/L	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	Total	Antimony	8.4	J-	8.4 J-	0.4	2	mg/kg	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	Total	Arsenic	567	J-	567 J-	0.7	2.5	mg/kg	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	Total	Barium	117	J-	117 J-	0.04	0.2	mg/kg	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	Total	Beryllium	0.423	J-	0.423 J-	0.025	0.2	mg/kg	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	Total	Cadmium	1.83	J-	1.83 J-	0.05	0.2	mg/kg	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	Total	Chromium	8.02	J-	8.02 J-	0.11	0.6	mg/kg	HT

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Fraction	Parameter	Original Value	Added Qualifier	New Value	MDL	PQL	Units	Reason
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	Total	Copper	13300	J-	13300 J-	2.9	10	mg/kg	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	Total	Lead	264	J-	264 J-	0.25	0.75	mg/kg	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	Total	Nickel	12.2	J-	12.2 J-	0.19	1	mg/kg	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-05	RAWTP-18 0-2"	4/29/2008	Soil	EPA 7471A	Total	Mercury	0.573	J-	0.573 J-	0.01	0.033	mg/kg	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	SPLP	Barium	0.02	J-	0.02 J-	0.0005	0.002	mg/L	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	SPLP	Copper	2.74	J-	2.74 J-	0.004	0.01	mg/L	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	SPLP	Lead	0.117	J-	0.117 J-	0.0039	0.0075	mg/L	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6020	SPLP	Antimony	0.0223	J-	0.0223 J-	0.0005	0.003	mg/L	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6020	SPLP	Arsenic	0.767	J-	0.767 J-	0.0007	0.004	mg/L	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 7470A	SPLP	Mercury	0.0025	J-	0.0025 J-	0.00008	0.0002	mg/L	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	Total	Antimony	11.2	J-	11.2 J-	0.4	2	mg/kg	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	Total	Arsenic	949	J-	949 J-	0.7	2.5	mg/kg	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	Total	Barium	112	J-	112 J-	0.04	0.2	mg/kg	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	Total	Beryllium	0.415	J-	0.415 J-	0.025	0.2	mg/kg	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	Total	Cadmium	4.65	J-	4.65 J-	0.05	0.2	mg/kg	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	Total	Chromium	20.8	J-	20.8 J-	0.11	0.6	mg/kg	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	Total	Copper	18800	J-	18800 J-	2.9	10	mg/kg	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	Total	Lead	489	J-	489 J-	0.25	0.75	mg/kg	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	Total	Nickel	26.2	J-	26.2 J-	0.19	1	mg/kg	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-06	RAWTP-12 0-2"	4/28/2008	Soil	EPA 7471A	Total	Mercury	0.978	J-	0.978 J-	0.01	0.033	mg/kg	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Barium	0.03	J-	0.03 J-	0.0005	0.002	mg/L	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Copper	0.97	J-	0.97 J-	0.004	0.01	mg/L	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Lead	0.0264	J-	0.0264 J-	0.0039	0.0075	mg/L	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6020	SPLP	Antimony	0.0163	J-	0.0163 J-	0.0005	0.003	mg/L	HT

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Fraction	Parameter	Original Value	Added Qualifier	New Value	MDL	PQL	Units	Reason
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6020	SPLP	Arsenic	1.63	J-	1.63 J-	0.0007	0.004	mg/L	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6020	SPLP	Selenium	0.0031	J-	0.0031 J-	0.0005	0.003	mg/L	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 7470A	SPLP	Mercury	0.0012	J-	0.0012 J-	0.00008	0.0002	mg/L	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	Total	Antimony	16.0	J-	16.0 J-	0.4	2	mg/kg	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	Total	Arsenic	1070	J-	1070 J-	0.7	2.5	mg/kg	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	Total	Barium	124	J-	124 J-	0.04	0.2	mg/kg	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	Total	Beryllium	0.583	J-	0.583 J-	0.025	0.2	mg/kg	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	Total	Cadmium	5.78	J-	5.78 J-	0.05	0.2	mg/kg	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	Total	Chromium	11.4	J-	11.4 J-	0.11	0.6	mg/kg	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	Total	Copper	50100	J-	50100 J-	29	100	mg/kg	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	Total	Lead	448	J-	448 J-	0.25	0.75	mg/kg	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	Total	Nickel	20.6	J-	20.6 J-	0.19	1	mg/kg	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-07	RAWTP-04 0-2"	5/1/2008	Soil	EPA 7471A	Total	Mercury	2.92	J-	2.92 J-	0.097	0.33	mg/kg	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Barium	0.02	J-	0.02 J-	0.0005	0.002	mg/L	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Copper	0.15	J-	0.15 J-	0.004	0.01	mg/L	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Lead	ND	UJ-	0.0075 UJ-	0.0039	0.0075	mg/L	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6020	SPLP	Antimony	0.0242	J-	0.0242 J-	0.0005	0.003	mg/L	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6020	SPLP	Arsenic	0.236	J-	0.236 J-	0.0007	0.004	mg/L	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 7470A	SPLP	Mercury	0.0056	J-	0.0056 J-	0.00008	0.0002	mg/L	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Antimony	16.0	J-	16.0 J-	0.4	2	mg/kg	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Arsenic	1520	J-	1520 J-	0.7	2.5	mg/kg	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Barium	129	J-	129 J-	0.04	0.2	mg/kg	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Beryllium	0.469	J-	0.469 J-	0.025	0.2	mg/kg	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Cadmium	3.78	J-	3.78 J-	0.05	0.2	mg/kg	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Chromium	6.27	J-	6.27 J-	0.11	0.6	mg/kg	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Copper	27900	J-	27900 J-	2.9	10	mg/kg	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Lead	457	J-	457 J-	0.25	0.75	mg/kg	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Nickel	15.8	J-	15.8 J-	0.19	1	mg/kg	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Fraction	Parameter	Original Value	Added Qualifier	New Value	MDL	PQL	Units	Reason
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-08	RAWTP-17 2"-1'	4/30/2008	Soil	EPA 7471A	Total	Mercury	1.95	J-	1.95 J-	0.097	0.33	mg/kg	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	SPLP	Barium	0.03	J-	0.03 J-	0.0005	0.002	mg/L	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	SPLP	Cadmium	0.002	J-	0.002 J-	0.001	0.002	mg/L	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	SPLP	Copper	1.97	J-	1.97 J-	0.004	0.01	mg/L	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	SPLP	Lead	ND	UJ-	0.0075 UJ-	0.0039	0.0075	mg/L	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6020	SPLP	Antimony	ND	UJ-	0.003 UJ-	0.0005	0.003	mg/L	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6020	SPLP	Arsenic	0.008	J-	0.008 J-	0.0007	0.004	mg/L	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 7470A	SPLP	Mercury	ND	R	0.0002 R	0.00008	0.0002	mg/L	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	Total	Antimony	5.3	J-	5.3 J-	0.4	2	mg/kg	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	Total	Arsenic	385	J-	385 J-	0.7	2.5	mg/kg	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	Total	Barium	95.8	J-	95.8 J-	0.04	0.2	mg/kg	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	Total	Beryllium	0.365	J-	0.365 J-	0.025	0.2	mg/kg	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	Total	Cadmium	ND	UJ-	0.20 UJ-	0.05	0.2	mg/kg	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	Total	Chromium	13.3	J-	13.3 J-	0.11	0.6	mg/kg	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	Total	Copper	1200	J-	1200 J-	0.29	1	mg/kg	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	Total	Lead	161	J-	161 J-	0.25	0.75	mg/kg	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	Total	Nickel	10.7	J-	10.7 J-	0.19	1	mg/kg	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-09	RAWTP-15 0-2"	4/30/2008	Soil	EPA 7471A	Total	Mercury	0.508	J-	0.508 J-	0.01	0.033	mg/kg	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Barium	0.04	J-	0.04 J-	0.0005	0.002	mg/L	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Cadmium	0.004	J-	0.004 J-	0.001	0.002	mg/L	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Copper	2.12	J-	2.12 J-	0.004	0.01	mg/L	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Lead	ND	UJ-	0.0075 UJ-	0.0039	0.0075	mg/L	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6020	SPLP	Antimony	0.0257	J-	0.0257 J-	0.0005	0.003	mg/L	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6020	SPLP	Arsenic	1.44	J-	1.44 J-	0.0007	0.004	mg/L	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6020	SPLP	Selenium	0.0049	J-	0.0049 J-	0.0005	0.003	mg/L	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 7470A	SPLP	Mercury	0.0026	J-	0.0026 J-	0.00008	0.0002	mg/L	HT

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Fraction	Parameter	Original Value	Added Qualifier	New Value	MDL	PQL	Units	Reason
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Antimony	6.7	J-	6.7 J-	0.4	2	mg/kg	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Arsenic	559	J-	559 J-	0.7	2.5	mg/kg	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Barium	125	J-	125 J-	0.04	0.2	mg/kg	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Beryllium	0.507	J-	0.507 J-	0.025	0.2	mg/kg	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Cadmium	1.99	J-	1.99 J-	0.05	0.2	mg/kg	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Chromium	8.34	J-	8.34 J-	0.11	0.6	mg/kg	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Copper	13800	J-	13800 J-	2.9	10	mg/kg	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Lead	187	J-	187 J-	0.25	0.75	mg/kg	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Nickel	13.6	J-	13.6 J-	0.19	1	mg/kg	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-10	RAWTP-10 2"-1'	4/30/2008	Soil	EPA 7471A	Total	Mercury	0.540	J-	0.540 J-	0.01	0.033	mg/kg	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Barium	0.01	J-	0.01 J-	0.0005	0.002	mg/L	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Copper	0.09	J-	0.09 J-	0.004	0.01	mg/L	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Lead	ND	UJ-	0.0075 UJ-	0.0039	0.0075	mg/L	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6020	SPLP	Antimony	0.0116	J-	0.0116 J-	0.0005	0.003	mg/L	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6020	SPLP	Arsenic	0.985	J-	0.985 J-	0.0007	0.004	mg/L	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6020	SPLP	Selenium	0.0031	J-	0.0031 J-	0.0005	0.003	mg/L	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 7470A	SPLP	Mercury	0.0037	J-	0.0037 J-	0.00008	0.0002	mg/L	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	Total	Antimony	3.6	J-	3.6 J-	0.4	2	mg/kg	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	Total	Arsenic	185	J-	185 J-	0.7	2.5	mg/kg	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	Total	Barium	128	J-	128 J-	0.04	0.2	mg/kg	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	Total	Beryllium	0.528	J-	0.528 J-	0.025	0.2	mg/kg	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	Total	Cadmium	1.00	J-	1.00 J-	0.05	0.2	mg/kg	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	Total	Chromium	11.7	J-	11.7 J-	0.11	0.6	mg/kg	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	Total	Copper	8560	J-	8560 J-	2.9	10	mg/kg	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	Total	Lead	71.9	J-	71.9 J-	0.25	0.75	mg/kg	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	Total	Nickel	17.1	J-	17.1 J-	0.19	1	mg/kg	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-11	RAWTP-04 1-2'	5/1/2008	Soil	EPA 7471A	Total	Mercury	0.445	J-	0.445 J-	0.01	0.033	mg/kg	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Barium	0.03	J-	0.03 J-	0.0005	0.002	mg/L	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Fraction	Parameter	Original Value	Added Qualifier	New Value	MDL	PQL	Units	Reason
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Copper	0.27	J-	0.27 J-	0.004	0.01	mg/L	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Lead	0.0076	J-	0.0076 J-	0.0039	0.0075	mg/L	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6020	SPLP	Antimony	0.0214	J-	0.0214 J-	0.0005	0.003	mg/L	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6020	SPLP	Arsenic	0.404	J-	0.404 J-	0.0007	0.004	mg/L	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 7470A	SPLP	Mercury	0.0006	J-	0.0006 J-	0.00008	0.0002	mg/L	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	Total	Antimony	ND	UJ-	2.0 UJ-	0.4	2	mg/kg	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	Total	Arsenic	99.6	J-	99.6 J-	0.7	2.5	mg/kg	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	Total	Barium	95.2	J-	95.2 J-	0.04	0.2	mg/kg	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	Total	Beryllium	0.637	J-	0.637 J-	0.025	0.2	mg/kg	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	Total	Cadmium	0.20	J-	0.20 J-	0.05	0.2	mg/kg	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	Total	Chromium	4.71	J-	4.71 J-	0.11	0.6	mg/kg	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	Total	Copper	702	J-	702 J-	0.29	1	mg/kg	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	Total	Lead	17.9	J-	17.9 J-	0.25	0.75	mg/kg	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	Total	Nickel	12.0	J-	12.0 J-	0.19	1	mg/kg	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-12	RAWTP-14 1-2'	4/29/2008	Soil	EPA 7471A	Total	Mercury	0.415	J-	0.415 J-	0.01	0.033	mg/kg	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	SPLP	Barium	0.02	J-	0.02 J-	0.0005	0.002	mg/L	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	SPLP	Copper	0.12	J-	0.12 J-	0.004	0.01	mg/L	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	SPLP	Lead	ND	UJ-	0.0075 UJ-	0.0039	0.0075	mg/L	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6020	SPLP	Antimony	0.0042	J-	0.0042 J-	0.0005	0.003	mg/L	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6020	SPLP	Arsenic	0.104	J-	0.104 J-	0.0007	0.004	mg/L	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 7470A	SPLP	Mercury	0.0002	J-	0.0002 J-	0.00008	0.0002	mg/L	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	Total	Antimony	2.5	J-	2.5 J-	0.4	2	mg/kg	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	Total	Arsenic	104	J-	104 J-	0.7	2.5	mg/kg	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	Total	Barium	145	J-	145 J-	0.04	0.2	mg/kg	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	Total	Beryllium	0.908	J-	0.908 J-	0.025	0.2	mg/kg	HT

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Fraction	Parameter	Original Value	Added Qualifier	New Value	MDL	PQL	Units	Reason
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	Total	Cadmium	ND	UJ-	0.20 UJ-	0.05	0.2	mg/kg	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	Total	Chromium	9.67	J-	9.67 J-	0.11	0.6	mg/kg	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	Total	Copper	948	J-	948 J-	0.29	1	mg/kg	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	Total	Lead	43.7	J-	43.7 J-	0.25	0.75	mg/kg	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	Total	Nickel	15.2	J-	15.2 J-	0.19	1	mg/kg	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-13	RAWTP-15 1-2'	4/30/2008	Soil	EPA 7471A	Total	Mercury	0.133	J-	0.133 J-	0.01	0.033	mg/kg	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Barium	0.007	J-	0.007 J-	0.0005	0.002	mg/L	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Copper	0.02	J-	0.02 J-	0.004	0.01	mg/L	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Lead	ND	UJ-	0.0075 UJ-	0.0039	0.0075	mg/L	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6020	SPLP	Antimony	0.0137	J-	0.0137 J-	0.0005	0.003	mg/L	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6020	SPLP	Arsenic	0.552	J-	0.552 J-	0.0007	0.004	mg/L	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 7470A	SPLP	Mercury	ND	R	0.0002 R	0.00008	0.0002	mg/L	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	Total	Antimony	ND	UJ-	2.0 UJ-	0.4	2	mg/kg	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	Total	Arsenic	69.3	J-	69.3 J-	0.7	2.5	mg/kg	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	Total	Barium	113	J-	113 J-	0.04	0.2	mg/kg	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	Total	Beryllium	0.260	J-	0.260 J-	0.025	0.2	mg/kg	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	Total	Cadmium	ND	UJ-	0.20 UJ-	0.05	0.2	mg/kg	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	Total	Chromium	12.8	J-	12.8 J-	0.11	0.6	mg/kg	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	Total	Copper	417	J-	417 J-	0.29	1	mg/kg	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	Total	Lead	14.2	J-	14.2 J-	0.25	0.75	mg/kg	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	Total	Nickel	16.4	J-	16.4 J-	0.19	1	mg/kg	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-14	RAWTP-06 1-2'	5/1/2008	Soil	EPA 7471A	Total	Mercury	0.065	J-	0.065 J-	0.01	0.033	mg/kg	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Barium	0.008	J-	0.008 J-	0.0005	0.002	mg/L	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Copper	0.03	J-	0.03 J-	0.004	0.01	mg/L	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Lead	ND	UJ-	0.0075 UJ-	0.0039	0.0075	mg/L	HT

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Fraction	Parameter	Original Value	Added Qualifier	New Value	MDL	PQL	Units	Reason
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6020	SPLP	Antimony	ND	UJ-	0.003 UJ-	0.0005	0.003	mg/L	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6020	SPLP	Arsenic	0.076	J-	0.076 J-	0.0007	0.004	mg/L	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 7470A	SPLP	Mercury	0.0004	J-	0.0004 J-	0.00008	0.0002	mg/L	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	Total	Antimony	ND	UJ-	2.0 UJ-	0.4	2	mg/kg	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	Total	Arsenic	15.7	J-	15.7 J-	0.7	2.5	mg/kg	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	Total	Barium	82.8	J-	82.8 J-	0.04	0.2	mg/kg	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	Total	Beryllium	0.479	J-	0.479 J-	0.025	0.2	mg/kg	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	Total	Cadmium	ND	UJ-	0.20 UJ-	0.05	0.2	mg/kg	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	Total	Chromium	5.02	J-	5.02 J-	0.11	0.6	mg/kg	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	Total	Copper	52.2	J-	52.2 J-	0.29	1	mg/kg	HT/RB
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	Total	Lead	7.83	J-	7.83 J-	0.25	0.75	mg/kg	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	Total	Nickel	8.65	J-	8.65 J-	0.19	1	mg/kg	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-15	RAWTP-18 1-2'	4/29/2008	Soil	EPA 7471A	Total	Mercury	0.055	J-	0.055 J-	0.01	0.033	mg/kg	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	SPLP	Barium	0.004	J-	0.004 J-	0.0005	0.002	mg/L	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	SPLP	Copper	0.08	J-	0.08 J-	0.004	0.01	mg/L	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	SPLP	Lead	ND	UJ-	0.0075 UJ-	0.0039	0.0075	mg/L	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6020	SPLP	Antimony	0.0039	J-	0.0039 J-	0.0005	0.003	mg/L	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6020	SPLP	Arsenic	0.314	J-	0.314 J-	0.0007	0.004	mg/L	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 7470A	SPLP	Mercury	0.0006	J-	0.0006 J-	0.00008	0.0002	mg/L	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	Total	Antimony	ND	UJ-	2.0 UJ-	0.4	2	mg/kg	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	Total	Arsenic	58.1	J-	58.1 J-	0.7	2.5	mg/kg	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	Total	Barium	81.3	J-	81.3 J-	0.04	0.2	mg/kg	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	Total	Beryllium	0.546	J-	0.546 J-	0.025	0.2	mg/kg	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	Total	Cadmium	ND	UJ-	0.20 UJ-	0.05	0.2	mg/kg	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	Total	Chromium	3.45	J-	3.45 J-	0.11	0.6	mg/kg	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	Total	Copper	492	J-	492 J-	0.29	1	mg/kg	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	Total	Lead	16.7	J-	16.7 J-	0.25	0.75	mg/kg	HT

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Fraction	Parameter	Original Value	Added Qualifier	New Value	MDL	PQL	Units	Reason
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	Total	Nickel	7.95	J-	7.95 J-	0.19	1	mg/kg	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-16	RAWTP-27 1-2'	4/28/2008	Soil	EPA 7471A	Total	Mercury	0.163	J-	0.163 J-	0.01	0.033	mg/kg	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	SPLP	Barium	0.03	J-	0.03 J-	0.0005	0.002	mg/L	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	SPLP	Copper	0.76	J-	0.76 J-	0.004	0.01	mg/L	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	SPLP	Lead	0.0373	J-	0.0373 J-	0.0039	0.0075	mg/L	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6020	SPLP	Antimony	0.0171	J-	0.0171 J-	0.0005	0.003	mg/L	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6020	SPLP	Arsenic	0.310	J-	0.310 J-	0.0007	0.004	mg/L	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 7470A	SPLP	Mercury	0.0008	J-	0.0008 J-	0.00008	0.0002	mg/L	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	Total	Antimony	3.7	J-	3.7 J-	0.4	2	mg/kg	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	Total	Arsenic	133	J-	133 J-	0.7	2.5	mg/kg	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	Total	Barium	78	J-	78 J-	0.04	0.2	mg/kg	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	Total	Beryllium	0.361	J-	0.361 J-	0.025	0.2	mg/kg	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	Total	Cadmium	0.34	J-	0.34 J-	0.05	0.2	mg/kg	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	Total	Chromium	4.29	J-	4.29 J-	0.11	0.6	mg/kg	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	Total	Copper	2710	J-	2710 J-	2.9	10	mg/kg	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	Total	Lead	143	J-	143 J-	0.25	0.75	mg/kg	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	Total	Nickel	5.90	J-	5.90 J-	0.19	1	mg/kg	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-17	RAWTP-BFD-06	5/1/2008	Soil	EPA 7471A	Total	Mercury	0.623	J-	0.623 J-	0.01	0.033	mg/kg	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	SPLP	Barium	0.004	J-	0.004 J-	0.0005	0.002	mg/L	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	SPLP	Beryllium	ND	UJ-	0.002 UJ-	0.0004	0.002	mg/L	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	SPLP	Cadmium	ND	UJ-	0.002 UJ-	0.001	0.002	mg/L	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	SPLP	Chromium	ND	UJ-	0.006 UJ-	0.001	0.006	mg/L	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	SPLP	Copper	0.07	J-	0.07 J-	0.004	0.01	mg/L	HT/RPD FD
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	SPLP	Lead	ND	UJ-	0.0075 UJ-	0.0039	0.0075	mg/L	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	SPLP	Nickel	ND	UJ-	0.01 UJ-	0.002	0.01	mg/L	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6020	SPLP	Antimony	0.0038	J-	0.0038 J-	0.0005	0.003	mg/L	HT/RPD FD
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6020	SPLP	Arsenic	0.222	J-	0.222 J-	0.0007	0.004	mg/L	HT/RPD FD
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6020	SPLP	Selenium	ND	UJ-	0.0030 UJ-	0.0005	0.003	mg/L	HT

Qualified Results Table
Resolution Copper Mining
Human Health Risk Assessment

SVL Lab ID	Client ID	Sample Collection Date	Type	Method	Fraction	Parameter	Original Value	Added Qualifier	New Value	MDL	PQL	Units	Reason
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6020	SPLP	Thallium	ND	UJ-	0.001 UJ-	0.00009	0.001	mg/L	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 7470A	SPLP	Mercury	0.0008	J-	0.0008 J-	0.00008	0.0002	mg/L	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	Total	Antimony	ND	UJ-	2.0 UJ-	0.4	2	mg/kg	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	Total	Arsenic	34.7	J-	34.7 J-	0.7	2.5	mg/kg	HT/RPD FD
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	Total	Barium	87.6	J-	87.6 J-	0.04	0.2	mg/kg	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	Total	Beryllium	0.372	J-	0.372 J-	0.025	0.2	mg/kg	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	Total	Cadmium	ND	UJ-	0.20 UJ-	0.05	0.2	mg/kg	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	Total	Chromium	9.94	J-	9.94 J-	0.11	0.6	mg/kg	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	Total	Copper	613	J-	613 J-	0.29	1	mg/kg	HT/RPD FD
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	Total	Lead	19.1	J-	19.1 J-	0.25	0.75	mg/kg	HT/RPD FD
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	Total	Nickel	19.8	J-	19.8 J-	0.19	1	mg/kg	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	Total	Selenium	ND	UJ-	4.0 UJ-	1.1	4	mg/kg	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 6010B	Total	Thallium	ND	UJ-	1.5 UJ-	0.3	1.5	mg/kg	HT
W8J0652-18	BFD-10	4/30/2008	Soil	EPA 7471A	Total	Mercury	0.162	J-	0.162 J-	0.01	0.033	mg/kg	HT/RPD FD

Notes

J- = estimated value with a low bias
UJ- = estimated reporting limit with a low bias
R = rejected result
mg/kg = milligrams per kilogram
mg/L = milligrams per liter (SPLP extract)
FD = field duplicate
HT = holding time
MDL = method detection limit
PQL = Practical Quantitation Limit
RB = rinse blank
RPD = relative percent difference
SPLP = synthetic precipitation leaching procedure

APPENDIX D

FIELD DUPLICATE TABLE

Field Duplicate Results
Resolution Copper Mining
Human Health Risk Assessment

Client ID Primary/FD	Laboratory ID Primary/FD	Method	Fraction	Units	Metal	Sample	Duplicate	RPD	Agreement (Yes) Non-agreement (No)
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	SPLP	mg/L	Barium	0.004	0.004	0%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	SPLP	mg/L	Beryllium	-0.002	-0.002	0%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	SPLP	mg/L	Cadmium	-0.002	-0.002	0%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	SPLP	mg/L	Chromium	-0.006	-0.006	0%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	SPLP	mg/L	Copper	0.13	0.07	60%	No
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	SPLP	mg/L	Lead	-0.0075	-0.0075	0%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	SPLP	mg/L	Nickel	-0.01	-0.01	0%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6020	SPLP	mg/L	Antimony	0.0069	0.0038	58%	No
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6020	SPLP	mg/L	Arsenic	0.34	0.222	42%	No
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6020	SPLP	mg/L	Selenium	-0.003	-0.003	0%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6020	SPLP	mg/L	Thallium	-0.001	-0.001	0%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 7470A	SPLP	mg/L	Mercury	0.0011	0.0008	32%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	Total	mg/kg	Antimony	2.3	ND	NC	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	Total	mg/kg	Arsenic	98.5	34.7	96%	No
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	Total	mg/kg	Barium	90.6	87.6	3%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	Total	mg/kg	Beryllium	0.416	0.372	11%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	Total	mg/kg	Cadmium	0.53	-0.2	442%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	Total	mg/kg	Chromium	11.4	9.94	14%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	Total	mg/kg	Copper	2190	613	113%	No
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	Total	mg/kg	Lead	51.3	19.1	91%	No
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	Total	mg/kg	Nickel	18.7	19.8	6%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	Total	mg/kg	Selenium	-4	-4	0%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 6010B	Total	mg/kg	Thallium	-1.5	-1.5	0%	Yes
RAWTP-03 2"-1' / BFD-10	W8J0652-01 / 18	EPA 7471A	Total	mg/kg	Mercury	0.43	0.162	91%	No

Notes

mg/kg = milligrams per kilogram
mg/L = milligrams per liter
FD = field duplicate
No = RPD is less than the control limit of 35; at least one result greater than five times the reporting limit
Yes = RPD less than control limit of 35 or parent and FD results are both less than five times the reporting limit and/or ND
RPD = relative percent difference
SPLP = synthetic precipitation leaching procedure

APPENDIX E

CLIENT COMMUNICATION

Peggy Cota

From: Morfin, Orestes <Orestes_Morfin@golder.com>
Sent: Tuesday, September 27, 2011 1:52 PM
To: Peggy Cota; Evelyn Dawson
Cc: Malusa, John
Subject: 2008 RAWTP sample shipping

Hello Peggy and Evelyn,
I received an e-mail today from Alejandra Bonilla, one of the two field crew who collected the 2008 RAWTP samples. She confirmed that the samples were shipped to SVL via FedEx.
I hope that helps.
Sincerely,
Orestes

Orestes Morfin (M.Sc.)| Project Hydrogeochemist | **Golder Associates Ltd.**
102, 2535 - 3rd Avenue S.E., Calgary, Alberta, Canada T2A 7W5
T: +1 (403) 299 5600 | **D:** +1 403 513-3574 | **F:** +1 (403) 299-5606 | **C:** +1 | **E:** Orestes_Morfin@golder.com | **www.golder.com**

Work Safe, Home Safe

APPENDIX F

ITSI STANDARD LEGAL NOTICE

ITSI STANDARD LEGAL NOTICE

ITSI is issuing this report at the request of the Client and based upon information furnished by Client. Further, the presence of environmental contamination can be influenced by many factors, including unknown and changing underground conditions. Therefore: 1. This report may not be relied upon by anyone for financial decision-making. 2. No one other than Client is authorized to use this report for any purpose. 3. Any conclusions or opinions included in this report are subject to reasonable revision based upon any new environmental or other data which is later developed. 4. Any results or conclusions stated are to be considered limited by the quality of the underlying sample or other data on which they are based, the budget established by the Client or otherwise for gathering and analyzing data, and by any assumptions and qualifications contained within this report.

APPENDIX C
SUMMARY OF GOLDER FEBRUARY 2009 SAMPLING EVENT
ON CD

Innovative Technical Solutions, Inc.

June 23, 2010

Casey McKeon, Ph.D
Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

RE: ITSI DATA VALIDATION REPORT
RESOLUTION COPPER MINING
SDGs W9D0292, W9D0297, and W9D0298

Dear Dr. McKeon:

Innovative Technical Solutions, Inc. (ITSI) has completed the data review for Resolution Copper Mining, LLC (RCML) for the Tier 2 RCML Human Health Risk Assessment (HHRA) laboratory confirmation sampling event. ITSI performed data review as described in the U.S. Environmental Protection Agency's (EPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004; the Lead Confirmation in the North and East Mountain Fronts RCML HHRA Sampling and Analysis Plan (SAP), February 2009, and using criteria in the referenced method.

The list of acronyms and abbreviations is included as Appendix A. The ITSI standard legal notice is provided as Appendix B. The client communication is provided on CDROM as Appendix C.

1.0 CROSS REFERENCE OF SAMPLES VERIFIED

The analytical data in the laboratory Sample Delivery Group (SDG) indicated below were reviewed. This SDG contained data for the following methods and compounds.

- Metals
  - Inductively coupled plasma/atomic emission spectroscopy (ICP/AES) by EPA Method 200.7;
  - ICP/mass spectrometry (MS) by EPA Method 6020; and,
  - Synthetic Precipitation Leaching Procedure (SPLP) by EPA Method 1312.

1501 West Fountainhead Parkway, Suite 360
Tempe, Arizona 85282
(480) 706-6488

The samples were analyzed by SVL Analytical (SVL) of Kellogg, Idaho. Table 1 below provides an analytical summary and cross reference for the sample(s). All samples underwent a full level 2 data validation.

Table 1 Analytical Summary and Sample Cross Reference

Field Sample ID	SVL Total Metals SDG	SVL AQ & SPLP Metals SDG	Collection Date	Metals
NMF-07HHRA-005S1	W9D0292-01	W9D0297-01	04/03/09	X
NMF-07HHRA-005E1	W9D0292-02	W9D0297-02	04/03/09	X
EMF-07HHRA-002N1	W9D0292-03	W9D0297-03	04/02/09	X
EMF-07HHRA-002S1	W9D0292-04	W9D0297-04	04/02/09	X
EMF-07HHRA-004N1	W9D0292-05	W9D0297-05	04/02/09	X
EMF-07HHRA-004W1	W9D0292-06	W9D0297-06	04/02/09	X
EMF-07HHRA-003N1	W9D0292-07	W9D0297-07	04/02/09	X
EMF-07HHRA-003W1	W9D0292-08	W9D0297-08	04/02/09	X
EMF-07HHRA-005N1	W9D0292-09	W9D0297-09	04/02/09	X
EMF-07HHRA-005E1	W9D0292-10	W9D0297-10	04/02/09	X
EMF-07HHRA-BFD2	W9D0292-11	--	04/03/09	X
SIEVE DRB	--	W9D0298-01	04/03/09	X

2.0 LABORATORY REPORT

The laboratory used data qualifier flags that are addressed in Section 4.0 to indicate quality control (QC) exceedences. There were no anomalies indicated in the case narrative that required data qualifier flags.

3.0 SAMPLE INTEGRITY

The chains-of-custody (COCs) were available for review. There were no anomalies that required qualification of the data.

4.0 DATA EVALUATION

4.1 SAMPLE RECEIPT AND HOLDING TIMES

The samples were extracted and analyzed within the method-recommended holding time. There were no anomalies concerning the receipt of the samples that required qualification of the data.

4.2 BLANK EVALUATION

Preparation and calibration blanks were analyzed to assess laboratory contamination. A decontamination rinsate blank (DRB), SIEVE DRB, was collected and analyzed according to the

SAP to assess field contamination. There was no contamination in the blanks that required qualification of the data.

4.3 INITIAL AND CONTINUING CALIBRATION

The initial and continuing calibration data and summaries were reviewed. All calibration standards were analyzed at the proper frequency and met the method.

4.4 SECOND SOURCE CALIBRATION VERIFICATION

The second source calibration verifications (SSCVs) were reviewed. There were no anomalies that required qualification of the data.

4.5 LABORATORY CONTROL SAMPLES (LCS)

A single laboratory control sample (LCS) was analyzed for each analysis. There were no anomalies that required qualification of the data.

4.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A matrix spike/matrix spike duplicate (MS/MSD) was analyzed for each analysis to measure accuracy and a laboratory sample duplicate was analyzed for each analysis to measure precision. There were no anomalies that required qualification of the data except as noted below.

4.7 CONTRACT REQUIRED QUANTITATION LIMIT CHECK STANDARD

A contract required quantitation limit (CRQL) check standard (CRI) was analyzed for each analysis. There were no anomalies that required qualification of the data.

4.8 SERIAL DILUTION

Serial dilutions were performed for arsenic analyzed by EPA 1312/6020. The total, aqueous and SPLP analysis of metals by EPA Methods 6010B and 1312/6010B did not require a serial dilution since the laboratory added internal standards to each sample. All recoveries or percent differences were within criteria.

4.9 PRACTICAL QUANTITATION LIMITS (PQLS) AND COMPOUND QUANTITATION

The laboratory PQLs and results were reviewed. The laboratory's PQLs met the criteria outlined in Table 1 of the SAP. There were no quantitation anomalies that required qualification of the data.

4.10 INSTRUMENT PERFORMANCE

The interference check samples (ICS) were reviewed. There were no anomalies that required qualification of the data.

4.11 FIELD DUPLICATE SAMPLES

Sample 07HHRA-BDF2 is a blind field duplicate (BFD) of Sample NMF-07HHRA-005S1. The Relative Percent Differences (RPD) for the positive results were evaluated and are reported in Table 2 below. There were no anomalies that required qualification of the data.

Table 2 Field Duplicate Samples and RPD Results

Primary and Duplicate Samples	Lab IDs	Analyte	Primary Sample Result	Duplicate Sample Result	Units	RPD %
NMF-07HHRA-005S1 07HHRA-BDF1	W9D0292-07 W9D0292-11	Arsenic (As)	162	146	mg/kg	10
NMF-07HHRA-005S1 07HHRA-BDF1	W9D0292-07 W9D0292-11	Copper (Cu)	2062	2320	mg/kg	12
NMF-07HHRA-005S1 07HHRA-BDF1	W9D0292-07 W9D0292-11	Lead (Pb)	323	339	mg/kg	5

All RPDs were within the criteria of less than 20. Therefore, no data qualifiers were required for field duplicate anomalies.

5.0 OVERALL ASSESSMENT FOR SDG

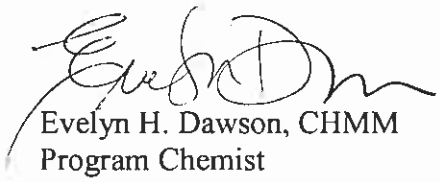
There were no qualified data results for the Tier 2 RCML HHRA sampling event. Based on the available information, all data are considered useable for their intended purposes.

6.0 RECOMMENDATIONS

ITSI has the no recommendations.

We thank you for the opportunity to serve you and apologize for any inconvenience this may have caused you.

Sincerely,
Innovative Technical Solutions, Inc.



Evelyn H. Dawson, CHMM
Program Chemist

Enclosures:

Appendix A – List of Acronyms and Abbreviations
Appendix B – ITSI Standard Legal Notice
Appendix C – Additional Data Provided by the Laboratory

cc: Orestes Morphin
Golder Associates, Inc.
4730 North Oracle Road, Suite 210
Tucson, Arizona, 85705

APPENDIX A

LIST OF ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS AND ABBREVIATIONS

COC	chain-of-custody
CRQL	Contract Required Quantitation Limit
AA	atomic absorption
AES	atomic emission spectroscopy
CRI	Contract Required Quantitation Limit Check Standard
EPA	U.S. Environmental Protection Agency
ICP	inductively coupled plasma
ICS	interference check sample
ITSI	Innovative Technical Solutions, Inc.
LCS	laboratory control samples
MDL	method detection limit
µg/L	micrograms per liter
mg/L	milligrams per liter
MS/MSD	matrix spike/matrix spike duplicate
PQL	practical quantitation limit
QAPP	Quality Assurance Project Plan
QC	quality control
RCML	Resolution Copper Mining, LLC
RPD	relative percent difference
SDG	Sample Delivery Group
SSCV	Second Source Calibration Verification
SVL	SVL Analytical

APPENDIX B

ITSI STANDARD LEGAL NOTICE

ITSI STANDARD LEGAL NOTICE

ITSI is issuing this report at the request of the Client and based upon information furnished by Client. Further, the presence of environmental contamination can be influenced by many factors, including unknown and changing underground conditions. Therefore: 1. This report may not be relied upon by anyone for financial decision-making. 2. No one other than Client is authorized to use this report for any purpose. 3. Any conclusions or opinions included in this report are subject to reasonable revision based upon any new environmental or other data which is later developed. 4. Any results or conclusions stated are to be considered limited by the quality of the underlying sample or other data on which they are based, the budget established by the Client or otherwise for gathering and analyzing data, and by any assumptions and qualifications contained within this report.

APPENDIX C

ADDITIONAL DATA PROVIDED BY THE LABORATORY
(on CDROM)

GOLDER ASSOCIATES

PROJECT NAME: RCML HHRA ANOMALOUS Pb SAMPLING

SVL/SDG: W9D0292

SDG: W9D0292

NARRATIVE

GOLDER

Project Name: RCML HHRA ANOMALOUS Pb SAMPLING

SVL/SDG: W9D0292

Samples were received April 15, 2009.
Cooler temperatures were 5.2°C and 3.2°C

Samples were prepared as instructions indicated.

Analyzed for arsenic, copper and lead.

"D" Flag indicates dilution was required.

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W9D0292 Method Type: SOW No.:

Contract: Lab Code: SVL Case No.: SAS No.:

Lab Sample ID	Client Sample ID	QC Description
W917163-MS1	NMF-07HHRA-005S1S	Matrix Spike
W917163-MSD1	NMF-07HHRA-005S1SD	Matrix Spike Duplicate
W9D0292-01	NMF-07HHRA-005S1	
W9D0292-02	NMF-07HHRA-005E1	
W9D0292-03	EMF-07HHRA-002N1	
W9D0292-04	EMF-07HHRA-002S1	
W9D0292-05	EMF-07HHRA-004N1	
W9D0292-06	EMF-07HHRA-004W1	
W9D0292-07	EMF-07HHRA-003N1	
W9D0292-08	EMF-07HHRA-003W1	
W9D0292-09	EMF-07HHRA-005N1	
W9D0292-10	EMF-07HHRA-005E1	
W9D0292-11	EMF-07HHRA-BFD2	

Were ICP interelement corrections applied?	Yes/No	Yes
Were ICP background corrections applied?	Yes/No	Yes
If yes - were raw data generated before applications of background corrections?	Yes/No	No

Comments: RCML HHRA ANOMALOUS Pb SAMPLING

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Kirby L. Gray Name: KIRBY L. GRAY

Date: 04/29/2009 Title: TECHNICAL DIRECTOR

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292 **Method Type:**

Sample ID: W9D0292-03 **Client ID:** EMF-07HHRA-002N1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 04/15/2009 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** Total

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	158	mg/Kg			P	0.62	OPTIMA1	W917163
7440-50-8	Copper	3150	mg/Kg			P	0.12	OPTIMA1	W917163
7439-92-1	Lead	236	mg/Kg			P	0.37	OPTIMA1	W917163

Color Before: BROWN **Clarity Before:** **Texture:** FINE

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments: DRIED AND SIEVED TO <250 µm FOR TOTAL METALS ANALYSIS

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292 **Method Type:**

Sample ID: W9D0292-04 **Client ID:** EMF-07HHRA-002S1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 04/15/2009 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** Total

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	225	mg/Kg			P	0.62	OPTIMA1	W917163
7440-50-8	Copper	3960	mg/Kg		D	P	2.4	OPTIMA1	W917163
7439-92-1	Lead	293	mg/Kg			P	0.37	OPTIMA1	W917163

Color Before: BROWN **Clarity Before:** **Texture:** FINE

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments: DRIED AND SIEVED TO <250 µm FOR TOTAL METALS ANALYSIS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292 **Method Type:**

Sample ID: W9D0292-07 **Client ID:** EMF-07HHRA-003N1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 04/15/2009 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** Total

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	162	mg/Kg			P	0.62	OPTIMA1	W917163
7440-50-8	Copper	2060	mg/Kg			P	0.12	OPTIMA1	W917163
7439-92-1	Lead	323	mg/Kg			P	0.37	OPTIMA1	W917163

Color Before: BROWN **Clarity Before:** **Texture:** FINE

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments: DRIED AND SIEVED TO <250 µm FOR TOTAL METALS ANALYSIS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292 **Method Type:**

Sample ID: W9D0292-08 **Client ID:** EMF-07HHRA-003W1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 04/15/2009 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** Total

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	272	mg/Kg			P	0.62	OPTIMA1	W917163
7440-50-8	Copper	3420	mg/Kg			P	0.12	OPTIMA1	W917163
7439-92-1	Lead	514	mg/Kg			P	0.37	OPTIMA1	W917163

Color Before: BROWN **Clarity Before:** **Texture:** FINE

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments: DRIED AND SIEVED TO <250 µm FOR TOTAL METALS ANALYSIS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292 **Method Type:**

Sample ID: W9D0292-05 **Client ID:** EMF-07HHRA-004N1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 04/15/2009 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** Total

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	211	mg/Kg			P	0.62	OPTIMA1	W917163
7440-50-8	Copper	3210	mg/Kg			P	0.12	OPTIMA1	W917163
7439-92-1	Lead	226	mg/Kg			P	0.37	OPTIMA1	W917163

Color Before: BROWN **Clarity Before:** **Texture:** FINE

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments: DRIED AND SIEVED TO <250 µm FOR TOTAL METALS ANALYSIS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292 **Method Type:**

Sample ID: W9D0292-06 **Client ID:** EMF-07HHRA-004W1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 04/15/2009 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** Total

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	251	mg/Kg			P	0.62	OPTIMA1	W917163
7440-50-8	Copper	3780	mg/Kg			P	0.12	OPTIMA1	W917163
7439-92-1	Lead	304	mg/Kg			P	0.37	OPTIMA1	W917163

Color Before: BROWN **Clarity Before:** **Texture:** FINE

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments: DRIED AND SIEVED TO <250 µm FOR TOTAL METALS ANALYSIS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292 **Method Type:**

Sample ID: W9D0292-10 **Client ID:** EMF-07HHRA-005E1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 04/15/2009 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** Total

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	291	mg/Kg			P	0.62	OPTIMA1	W917163
7440-50-8	Copper	3820	mg/Kg			P	0.12	OPTIMA1	W917163
7439-92-1	Lead	307	mg/Kg			P	0.37	OPTIMA1	W917163

Color Before: BROWN **Clarity Before:** **Texture:** FINE

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments: DRIED AND SIEVED TO <250 µm FOR TOTAL METALS ANALYSIS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292 **Method Type:**

Sample ID: W9D0292-09 **Client ID:** EMF-07HHRA-005N1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 04/15/2009 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** Total

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	210	mg/Kg			P	0.62	OPTIMA1	W917163
7440-50-8	Copper	969	mg/Kg			P	0.12	OPTIMA1	W917163
7439-92-1	Lead	155	mg/Kg			P	0.37	OPTIMA1	W917163

Color Before: BROWN **Clarity Before:** **Texture:** FINE

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments: DRIED AND SIEVED TO <250 µm FOR TOTAL METALS ANALYSIS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292 **Method Type:**

Sample ID: W9D0292-11 **Client ID:** EMF-07HHRA-BFD2

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 04/15/2009 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** Total

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	146	mg/Kg			P	0.62	OPTIMA1	W917163
7440-50-8	Copper	2320	mg/Kg			P	0.12	OPTIMA1	W917163
7439-92-1	Lead	339	mg/Kg			P	0.37	OPTIMA1	W917163

Color Before: BROWN **Clarity Before:** **Texture:** FINE

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments: DRIED AND SIEVED TO <250 µm FOR TOTAL METALS ANALYSIS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292 **Method Type:**

Sample ID: W9D0292-02 **Client ID:** NMF-07HHRA-005E1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 04/15/2009 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** Total

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	97.4	mg/Kg			P	0.62	OPTIMA1	W917163
7440-50-8	Copper	1170	mg/Kg			P	0.12	OPTIMA1	W917163
7439-92-1	Lead	271	mg/Kg			P	0.37	OPTIMA1	W917163

Color Before: BROWN **Clarity Before:** **Texture:** FINE

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments: DRIED AND SIEVED TO <250 µm FOR TOTAL METALS ANALYSIS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292 **Method Type:**

Sample ID: W9D0292-01 **Client ID:** NMF-07HHRA-005S1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Date Received:** 04/15/2009 **Level:** LOW

% Solids: 100.0 **Total/Dissolved:** Total

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	79.1	mg/Kg			P	0.62	OPTIMA1	W917163
7440-50-8	Copper	702	mg/Kg			P	0.12	OPTIMA1	W917163
7439-92-1	Lead	178	mg/Kg			P	0.37	OPTIMA1	W917163

Color Before: BROWN **Clarity Before:** **Texture:** FINE

Color After: YELLOW **Clarity After:** **Artifacts:**

Comments: DRIED AND SIEVED TO <250 µm FOR TOTAL METALS ANALYSIS

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Initial Calibration Source: 09D0346

Continuing Calibration Source: 09D0346

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV									
	Arsenic	2068.94	2000.0	103	90.0 - 110.0	P	04/28/2009	08:44	W917163
	Copper	2041.51	2000.0	102	90.0 - 110.0	P	04/28/2009	08:44	W917163
	Lead	2004.71	2000.0	100	90.0 - 110.0	P	04/28/2009	08:44	W917163
ICV									
	Arsenic	2051.26	2000.0	103	90.0 - 110.0	P	04/28/2009	08:54	W917163
	Copper	2021.36	2000.0	101	90.0 - 110.0	P	04/28/2009	08:54	W917163
	Lead	1971.74	2000.0	99	90.0 - 110.0	P	04/28/2009	08:54	W917163
CCV									
	Arsenic	2057.45	2000.0	103	90.0 - 110.0	P	04/28/2009	09:24	W917163
	Copper	2008.29	2000.0	100	90.0 - 110.0	P	04/28/2009	09:24	W917163
	Lead	1967.73	2000.0	98	90.0 - 110.0	P	04/28/2009	09:24	W917163
CCV									
	Arsenic	1994.02	2000.0	100	90.0 - 110.0	P	04/28/2009	11:09	W917163
	Copper	1948.51	2000.0	97	90.0 - 110.0	P	04/28/2009	11:09	W917163
	Lead	1930.14	2000.0	97	90.0 - 110.0	P	04/28/2009	11:09	W917163
CCV									
	Arsenic	2003.97	2000.0	100	90.0 - 110.0	P	04/28/2009	12:07	W917163
	Copper	1942.00	2000.0	97	90.0 - 110.0	P	04/28/2009	12:07	W917163
	Lead	1923.68	2000.0	96	90.0 - 110.0	P	04/28/2009	12:07	W917163

- 2b -
CRDL STANDARD FOR AA & ICP

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

AA CRDL Standard Source:

ICP CRDL Standard Source: 09D0182

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Advisory Limits (%R)	M	Analysis Date	Analysis Time	Run Number
CRI									
	Arsenic	25.66	25.0	103	50 - 150	P	04/28/200	09:06	W917163
	Copper	9.59	10.0	96	50 - 150	P	04/28/200	09:06	W917163
	Lead	8.40	7.5	112	50 - 150	P	04/28/200	09:06	W917163

- 3a -
INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Arsenic	6.500	+/-25.000	U	6.500	25.000	P	04/28/2009	09:00	W917163
	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/28/2009	09:00	W917163
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/28/2009	09:00	W917163
CCB										
	Arsenic	6.500	+/-25.000	U	6.500	25.000	P	04/28/2009	09:30	W917163
	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/28/2009	09:30	W917163
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/28/2009	09:30	W917163
CCB										
	Arsenic	6.500	+/-25.000	U	6.500	25.000	P	04/28/2009	11:15	W917163
	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/28/2009	11:15	W917163
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/28/2009	11:15	W917163
CCB										
	Arsenic	6.500	+/-25.000	U	6.500	25.000	P	04/28/2009	12:13	W917163
	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/28/2009	12:13	W917163
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/28/2009	12:13	W917163

- 3b -
PREPARATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result (mg/Kg)	Conc Qual	Q	Acceptance Limit	MDL	PQL	M	Analysis Date	Analysis Time	Run
W917163-BLK1			SOIL								
	Arsenic	0.620U			+/-0.620	0.620	2.500	P	04/28/2009	10:02	W917163
	Copper	0.120U			+/-0.120	0.120	1.000	P	04/28/2009	10:02	W917163
	Lead	0.373B			+/-0.370	0.370	0.750	P	04/28/2009	10:02	W917163

- 4 -

INTERFERENCE CHECK SAMPLE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

ICS Source: 09D0295/09D0296 **Instrument ID:** OPTIMA1

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window	Analysis Date	Analysis Time	Run Number
ICSA								
	Arsenic	1.3				04/28/2009	09:11	W917163
	Copper	11200	10000	112	80 - 120%	04/28/2009	09:11	W917163
	Lead	-0.033				04/28/2009	09:11	W917163
ICSAB								
	Arsenic	530	500	106	80 - 120%	04/28/2009	09:18	W917163
	Copper	593	500	119	80 - 120%	04/28/2009	09:18	W917163
	Lead	481	500	96	80 - 120%	04/28/2009	09:18	W917163

- 5a -

MATRIX SPIKE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W9D0292

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W9D0292-01 **Client ID:** NMF-07HHRA-005S1S

Percent Solids for Sample: 100.00 **Spiked ID:** W917163-MS1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	175.0846		79.1242		100.00	96		P
Copper	mg/Kg	75 - 125	789.3503		702.4193		100.00	87		P
Lead	mg/Kg	75 - 125	263.1276		178.4643		100.00	85		P

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W9D0292

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W9D0292-01 **Client ID:** NMF-07HHRA-005S1SD

Percent Solids for Sample: 100.00 **Spiked ID:** W917163-MSD1 **Percent Solids for Spike Sample:** 100.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	mg/Kg	75 - 125	175.8056		79.1242		100.00	97		P
Copper	mg/Kg	75 - 125	770.2400		702.4193		100.00	68		P
Lead	mg/Kg	75 - 125	262.1515		178.4643		100.00	84		P

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W9D0292

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SOIL **Sample ID:** W917163-MS1 **Client ID:** NMF-07HHRA-005S1SD

Percent Solids for Sample: 100.00 **Duplicate ID:** W917163-MSD1 **Percent Solids for Duplicate:** 100.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	mg/Kg		175.0846		175.8056		0		P
Copper	mg/Kg		789.3503		770.2400		2		P
Lead	mg/Kg		263.1276		262.1515		0		P

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Aqueous LCS Source: **Solid LCS Source:** QC19115SCSN

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
W917163-BS1								
	Arsenic	mg/Kg	100.0	98.4		98	80.0 - 120.0	P
	Copper	mg/Kg	100.0	103.5		104	80.0 - 120.0	P
	Lead	mg/Kg	100.0	92.5		92	80.0 - 120.0	P

- 10 -

METHOD DETECTION LIMITS

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Analyte	Wave- length (nm)	MDL ug/L	PQL ug/L
OPTIMA1			**Date:** 12/23/2008
Arsenic Water	188.979	6.5 ug/L	25 ug/L
Copper Water	324.752	3.9 ug/L	10 ug/L
Lead Water	220.353	3.9 ug/L	8 ug/L
Arsenic Soil	188.979	0.62 mg/kg	2.5 mg/kg
Copper Soil	324.752	0.12 mg/kg	1.0 mg/kg
Lead Soil	220.353	0.37 mg/kg	0.75 mg/kg

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0292

Contract: _____ Lab Code: SVL Case No.: _____ SAS No.: _____

Instrument ID: OPTIMA1 Date: 07/17/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	As
Aluminum	308.22	0.0000000	0.0131100	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.1071000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.1485000	0.0391000	0.0089000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0240000	0.0010100	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0037000	0.0000000	0.0000000
Cadmium	226.50	-0.0073400	0.0000000	0.2214000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0005000	-0.0017000	0.0000000
Cobalt	228.62	0.0052000	0.0000000	0.0146700	0.0000000	0.0000000
Copper	324.75	0.0078000	0.0000000	-0.0930000	0.0127000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	-0.0309000	0.0000000
Lead	220.35	0.0325000	0.0031000	0.1591000	0.0083000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0886000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0194000	0.0277000	0.0000000
Nickel	232.00	-0.0011000	-0.0116000	-0.8534000	0.0090000	0.1015000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.1266000	-0.0218000	-0.0419000	0.0304000	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0778000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0084000	-0.0112000	-0.1255000	-0.0344000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0360000	0.0011560	0.0000000
Zinc	206.20	0.0039000	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA1 **Date:** 07/17/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Ba	Be	Cd	Co	Cr
Aluminum	308.22	-0.6131000	0.0000000	0.0000000	-6.0100002	-0.0110000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	9.4982004
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.7128000
Barium	233.53	0.0000000	0.0000000	0.0000000	-0.0406000	-0.0874000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	-0.1159000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	-0.0285000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	1.8019000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	-0.1706000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	2.1972001	0.0000000
Lead	220.35	0.0000000	0.2623000	0.0000000	0.0249000	-0.1072000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	-1.3487000	-0.6500000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.4909000	-0.1548000
Nickel	232.00	0.0000000	-0.3557000	0.0000000	0.0096000	33.9971008
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	1.0620000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	2.6372001	0.5573000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	-1.4418000
Zinc	206.20	0.0000000	-0.0327000	0.3972000	0.0000000	-0.5552000

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Instrument ID: OPTIMA1 **Date:** 07/17/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Cu	K	Mn	Mo	Ni
Aluminum	308.22	0.0000000	0.0000000	0.0000000	5.7308002	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.4777000	0.0000000
Barium	233.53	0.0000000	0.0000000	-0.0270800	-0.3819000	0.0050000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	-0.0202400	0.0000000	-0.0048000	-0.0345000	-0.5721900
Calcium	315.89	0.0000000	0.0000000	0.0000000	1.4406700	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	-0.1309000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.1714390
Copper	324.75	0.0000000	0.0000000	0.0000000	0.7193000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	1.1483999	0.0000000	0.2609600	-0.7003500	0.2124000
Magnesium	279.08	0.0000000	0.0028000	-6.7768998	-6.2502999	0.1948000
Manganese	260.57	0.0000000	0.0000000	0.0000000	-0.0523000	0.0000000
Nickel	232.00	-0.4576000	0.0000000	-2.6942000	3.9579999	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.3357000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.2081400	0.0987000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	-10.4635000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	-0.0639000	-6.2765999	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.3702000	0.8905000	-0.2085000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0292

Contract: Lab Code: SVL Case No.: SAS No.:

Instrument ID: OPTIMA1 Date: 07/17/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: P	Sb	Se	Si	Sn
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	1.1009001
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	-2.2695999
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0344000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0144000	-0.1669400	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0070000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.1645000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.1446000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.6663000	0.1814000	-0.0623100	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0292

Contract: _____ Lab Code: SVL Case No.: _____ SAS No.: _____

Instrument ID: OPTIMA1 Date: 07/17/2008

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Ti	U	V	Zn	La
Aluminum	308.22	1.4739000	-6.5716400	9.4038000	0.0000000	0.0000000
Antimony	206.84	0.0000000	-1.0741000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	-1.8369000	0.0000000	0.0000000	0.0000000	33.0822983
Barium	233.53	0.0000000	-0.1777000	-0.7350000	0.0033000	0.0000000
Beryllium	313.11	0.0825000	-0.3040000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0606770	-0.1451000	0.0000000	0.0000000	-0.1140000
Calcium	315.89	0.0000000	5.3004999	-1.6645000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.6494000	0.1807000	0.0000000	0.0000000
Cobalt	228.62	1.5543000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.2501000	0.8966000	0.0000000	0.0000000	-0.0474000
Iron	273.96	0.0000000	-1.7112000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	1.1411999	-0.2283000	-0.0112000	-0.2660000
Magnesium	279.08	-1.2385000	5.7515998	-0.1741000	0.0000000	0.0000000
Manganese	260.57	0.0000000	-0.1178000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.3400000	0.3127000	0.0000000	-0.5781000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	-2.3810999	0.0000000	0.0000000	-1.2065500
Silver	328.07	0.0000000	0.7301860	-0.0570000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.5265000	0.1363600	2.4705000	0.0000000	0.0000000
Vanadium	292.40	0.5177000	-1.0334001	0.0000000	0.0000000	0.2382700
Zinc	206.20	0.0000000	0.0000000	-0.0877000	0.0000000	0.0000000

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA1 **Date:** 04/21/2008

Analyte	Integration Time (sec)	LDR ug/L
Arsenic	20.00	20000
Copper	20.00	50000
Lead	20.00	100000

- 13 -

SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0292

Contract: **Lab Code:** SVL **Method:** P

Case No.: **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number:	EPA 3050B-04232009						
W917163-BLK1	PBS	MB	SOIL	4/23/09	1.00	100.0	100.00
W917163-BS1	LCSS	LCS	SOIL	4/23/09	1.00	100.0	100.00
W9D0292-01	NMF-07HHRA-005S1	SAM	SOIL	4/23/09	1.00	100.0	100.00
W917163-MS1	NMF-07HHRA-005S1S	MS	SOIL	4/23/09	1.00	100.0	100.00
W917163-MSD1	NMF-07HHRA-005S1SD	MSD	SOIL	4/23/09	1.00	100.0	100.00
W9D0292-02	NMF-07HHRA-005E1	SAM	SOIL	4/23/09	1.00	100.0	100.00
W9D0292-03	EMF-07HHRA-002N1	SAM	SOIL	4/23/09	1.00	100.0	100.00
W9D0292-04	EMF-07HHRA-002S1	SAM	SOIL	4/23/09	1.00	100.0	100.00
W9D0292-05	EMF-07HHRA-004N1	SAM	SOIL	4/23/09	1.00	100.0	100.00
W9D0292-06	EMF-07HHRA-004W1	SAM	SOIL	4/23/09	1.00	100.0	100.00
W9D0292-07	EMF-07HHRA-003N1	SAM	SOIL	4/23/09	1.00	100.0	100.00
W9D0292-08	EMF-07HHRA-003W1	SAM	SOIL	4/23/09	1.00	100.0	100.00
W9D0292-09	EMF-07HHRA-005N1	SAM	SOIL	4/23/09	1.00	100.0	100.00
W9D0292-10	EMF-07HHRA-005E1	SAM	SOIL	4/23/09	1.00	100.0	100.00
W9D0292-11	EMF-07HHRA-BFD2	SAM	SOIL	4/23/09	1.00	100.0	100.00

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W9D0292

Instrument ID Number: OPTIMA1 Method: P Run Number: W917163

Start Date: 04/28/2009 End Date: 04/28/2009

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CALIB BLANK 1	1.00	0814				X							X		X											
STD1	1.00	0820				X							X		X											
STD2	1.00	0826																								
STD3	1.00	0831																								
STD4	1.00	0836																								
STD5	1.00	0840																								
ICV	1.00	0844				X							X		X											
ICV	1.00	0854				X							X		X											
ICB	1.00	0900				X							X		X											
CRI	1.00	0906				X							X		X											
ICSA	1.00	0911				X							X		X											
ICSAB	1.00	0918				X							X		X											
CCV	1.00	0924				X							X		X											
CCB	1.00	0930				X							X		X											
PBS	1.00	1002				X							X		X											
LCSS	1.00	1007				X							X		X											
NMF-07HHRA-005S1	1.00	1013				X							X		X											
NMF-07HHRA-005S1S	1.00	1024				X							X		X											
NMF-07HHRA-005S1SD	1.00	1031				X							X		X											
NMF-07HHRA-005E1	1.00	1037				X							X		X											
EMF-07HHRA-002N1	1.00	1044				X							X		X											
EMF-07HHRA-002S1	1.00	1050				X							X		X											
EMF-07HHRA-004N1	1.00	1056				X							X		X											
EMF-07HHRA-002S1	20.00	1103				X							X		X											
CCV	1.00	1109				X							X		X											
CCB	1.00	1115				X							X		X											
EMF-07HHRA-004W1	1.00	1121				X							X		X											
EMF-07HHRA-003N1	1.00	1128				X							X		X											
EMF-07HHRA-003W1	1.00	1135				X							X		X											
EMF-07HHRA-005N1	1.00	1141				X							X		X											
EMF-07HHRA-005E1	1.00	1148				X							X		X											
EMF-07HHRA-BFD2	1.00	1155				X							X		X											
ZZZZZZ	20.00	1201																								
CCV	1.00	1207				X							X		X											
CCB	1.00	1213				X							X		X											

W917163

SVL ANALYTICAL

Log/Preparation Bench Sheet

See Extraction Comments

W917163

33

Matrix: Solid

Prepared using: SOP 4094 (3050B ICP)

Earliest Due: 04/29/09 Earliest Expiration: 09/29/09 08:50

				Origin	Hold Time Expires	Home Location	Client	Due Dat
W917163-BLK1	Blank		[1g - 100mL]					
W917163-BS1	LCS		[1g - 100mL]	Spike 1: 09B0104				
W917163-MS1	Matrix Spike [W9D0292-01]		[1g - 100mL]	Spike 1: 09B0104				
W917163-MSD1	MS Dup [W9D0292-01]		[1g - 100mL]	Spike 1: 09B0104				
W9D0292-01	B by T 6010B	As Cu Pb						29-Apr-0
ClientSample ID:	NMF-07HHRA-005S1		[1g - 100mL]	Arizona	30-Sep-09 11:15	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-02	B by T 6010B	As Cu Pb						29-Apr-0
ClientSample ID:	NMF-07HHRA-005E1		[1g - 100mL]	Arizona	30-Sep-09 11:00	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-03	B by T 6010B	As Cu Pb						29-Apr-0
ClientSample ID:	EMF-07HHRA-002N1		[1g - 100mL]	Arizona	29-Sep-09 08:50	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-04	B by T 6010B	As Cu Pb						29-Apr-0
ClientSample ID:	EMF-07HHRA-002S1		[1g - 100mL]	Arizona	29-Sep-09 08:55	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-05	B by T 6010B	As Cu Pb						29-Apr-0
ClientSample ID:	EMF-07HHRA-004N1		[1g - 100mL]	Arizona	29-Sep-09 10:50	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-06	B by T 6010B	As Cu Pb						29-Apr-0
ClientSample ID:	EMF-07HHRA-004W1		[1g - 100mL]	Arizona	29-Sep-09 10:55	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-07	B by T 6010B	As Cu Pb						29-Apr-0
ClientSample ID:	EMF-07HHRA-003N1		[1g - 100mL]	Arizona	29-Sep-09 13:20	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-08	B by T 6010B	As Cu Pb						29-Apr-0
ClientSample ID:	EMF-07HHRA-003W1		[1g - 100mL]	Arizona	29-Sep-09 13:15	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-09	B by T 6010B	As Cu Pb						29-Apr-0
ClientSample ID:	EMF-07HHRA-005N1		[1g - 100mL]	Arizona	29-Sep-09 15:20	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-10	B by T 6010B	As Cu Pb						29-Apr-0
ClientSample ID:	EMF-07HHRA-005E1		[1g - 100mL]	Arizona	29-Sep-09 15:45	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-11	B by T 6010B	As Cu Pb						29-Apr-0
ClientSample ID:	EMF-07HHRA-BFD2		[1g - 100mL]	Arizona	30-Sep-09 12:30	BoilerRm 07 F	Golder Associates (AZ)	

level 3

04/29/2009

M3-Cu

Preparation Reagents

Standard	Description	Lot Number
09A0190	HNO3, conc.	K1408
09C0150	H2O2, 30%	200833608

Standard	Description	Lot Number
09B0018	1:1 HNO3	K1408
09D0202	HCl, conc.	46257

Spike Standards

Standard	Description	Amount (µL)
09B0104	QC19115ScSn SOIL DIG	1000

Standard	Description	Amount (µL)

Digested By: NB Date/Time: 04/23/09 1035 Instrument ID: ICP Optima ☒1 ☐5 ☐6 ☐7

Analyzed By: DT Date/Time: 4/28/09

Reviewed By: Date: 04/29/2009 Data File(s): 09118A

Instrument operating conditions and parameters for this analytical batch are as stated in the Standard Operating Procedure for the analysis listed above unless otherwise noted.

SVL ANALYTICAL, INC. KELLOGG, IDAHO

ICP-AES STANDARDS

STANDARD	SOURCE/LOT #	PREP DATE	PREP BY
S0/ICB/CCB	09D0347	4/24/2009	AS
S1	09D0231 ✓	4/20/2009	AS
S2	09D0179	4/16/2009	AS
S3	09D0180	4/16/2009	AS
S4	09C0243	3/23/2009	AS
S5	09C0224	3/21/2009	AS
ICV/CCV	09D0346	4/24/2009	AS
CRI	09D0182	4/16/2009	AS
ICSA	09D0295	4/22/2009	AS
ICSAB	09D0296	4/22/2009	AS

QCS26

QCS26 ICV/CCV SS ✓

Analytical Standard Summary

09D0347

36

Description: S0
Standard Type: Calibration Standard
Solvent: 2% HNO3 5% HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 08E0100
Prepared: 23-Apr-09
Expires: 15-Oct-09

Comments: OPT 1 & 5

Analyte	CAS Number	Concentration	Units
Hydrochloric Acid	7647-01-0	50000	mg/L
Nitric Acid	7697-37-2	20000	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09D0201	HCl, conc.	Hydrochloric Ac	18-Apr-09	Vendor	15-Oct-09	1000000 ppm	50
09A0183	HNO3, conc.	Nitric Acid	15-Jan-09	Vendor	14-Jan-10	1000000 ppm	20

Anne Spradlin 4/24/09
Prepared By Date

DG 04/23/09
Reviewed By Date

Analytical Standard Summary

09D0231

36

Description: S1
Standard Type: Calibration Standard
Solvent: 2% HNO3 5% HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : -
Prepared: 20-Apr-09
Expires: 26-Jul-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	3	mg/L
Antimony	7440-36-0	3	mg/L
Arsenic	7440-38-2	3	mg/L
Barium	7440-39-3	3	mg/L
Beryllium	7440-41-7	3	mg/L
Bismuth	7440-69-9	5	mg/L
Boron	7440-42-8	3	mg/L
Cadmium	7440-43-9	3	mg/L
Calcium	7440-70-2	3	mg/L
Chromium	7440-47-3	3	mg/L
Cobalt	7440-48-4	3	mg/L
Copper	7440-50-8	3	mg/L
Gallium	7440-55-3	5	mg/L
Iron	7439-89-6	3	mg/L
Lead	7439-92-1	3	mg/L
Lithium	7439-93-2	8	mg/L
Magnesium	7439-95-4	3	mg/L
Manganese	7439-96-5	3	mg/L
Molybdenum	7439-98-7	3	mg/L
Nickel	7440-02-0	3	mg/L
Phosphorus	7723-14-0	10	mg/L
Potassium	7440-09-7	30	mg/L
Selenium	7782-49-2	3	mg/L
Silica (SiO2)	7631-86-9	3.21	mg/L
Silicon	7440-21-3	1.5	mg/L
Silver	7440-22-4	3	mg/L
Sodium	7440-23-5	3	mg/L
Strontium	7440-24-6	5	mg/L
Thallium	7440-28-0	3	mg/L
Tin	7440-31-5	5	mg/L
Titanium	7440-32-6	3	mg/L
Vanadium	7440-62-2	3	mg/L
Zinc	7440-66-6	3	mg/L

Analytical Standard Summary

09D0231

37

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0292	S1 MIX	Strontium	26-Jan-09	Anne Spradlin	26-Jul-09	500 mg/L	10
09A0292	S1 MIX	Phosphorus	26-Jan-09	Anne Spradlin	26-Jul-09	1000 mg/L	10
09A0292	S1 MIX	Lithium	26-Jan-09	Anne Spradlin	26-Jul-09	800 mg/L	10
09A0292	S1 MIX	Gallium	26-Jan-09	Anne Spradlin	26-Jul-09	500 mg/L	10
09A0292	S1 MIX	Bismuth	26-Jan-09	Anne Spradlin	26-Jul-09	500 mg/L	10
09A0292	S1 MIX	Tin	26-Jan-09	Anne Spradlin	26-Jul-09	500 mg/L	10
08J0535	QCS-26 (0816542)	Barium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Iron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Copper	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Cobalt	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Chromium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Calcium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Cadmium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Lead	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Beryllium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Potassium	30-Oct-08	Vendor	16-Oct-09	1000 ug/mL	30
08J0535	QCS-26 (0816542)	Arsenic	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Antimony	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Boron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Magnesium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Manganese	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Aluminum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Nickel	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Selenium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Silica (SiO2)	30-Oct-08	Vendor	16-Oct-09	107 ug/mL	30
[illegible]0535	QCS-26 (0816542)	Silicon	30-Oct-08	Vendor	16-Oct-09	50 ug/mL	30
[illegible]0535	QCS-26 (0816542)	Silver	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Sodium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Thallium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Titanium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Vanadium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Zinc	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Molybdenum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30

Anne Spradlin 4/20/09

Prepared By Date

DT 4/22/09

Reviewed By Date

Analytical Standard Summary

09D0179

38

Description: S2
Standard Type: Calibration Standard
Solvent: 2%HN03 5% HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 192-262-1
Prepared: 16-Apr-09
Expires: 13-Oct-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	50	mg/L
Calcium	7440-70-2	50	mg/L
Iron	7439-89-6	50	mg/L
Magnesium	7439-95-4	50	mg/L
Sodium	7440-23-5	50	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08H0316	Sodium	Sodium	26-Aug-08	Vendor	19-Feb-10	10000 ug/mL	5
08H0314	Iron	Iron	26-Aug-08	Vendor	19-Feb-10	10000 ug/mL	5
08H0313	Calcium	Calcium	26-Aug-08	Vendor	19-Feb-10	10000 ug/mL	5
08H0312	Aluminum	Aluminum	26-Aug-08	Vendor	19-Feb-10	10000 ug/mL	5
08F0350	Magnesium	Magnesium	23-Jun-08	Vendor	12-Dec-09	10000 ug/mL	5

Anne Spradlin 4/16/09
Prepared By Date

DT 4/22/09
Reviewed By Date

Analytical Standard Summary

09D0180

39

Description: S3
Standard Type: Calibration Standard
Solvent: 2%HNO3 5%HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 192-262-2
Prepared: 16-Apr-09
Expires: 07-Jun-09

Comments:

Analyte	CAS Number	Concentration	Units
Beryllium	7440-41-7	0.1	mg/L
Lanthanum	7439-91-0	10	mg/L
Scandium	7440-20-2	2	mg/L
Silica (SiO2)	7631-86-9	53.5	mg/L
Silicon	7440-21-3	25	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0111	Lanthanum	Lanthanum	12-Jan-09	Vendor	30-Jun-10	10000 ug/mL	1
07L0017	Silicon	Silicon	14-Dec-07	Vendor	07-Jun-09	10000 ug/mL	2.5
07L0017	Silicon	Silica (SiO2)	14-Dec-07	Vendor	07-Jun-09	21400 ug/mL	2.5
07L0011	Beryllium	Beryllium	14-Dec-07	Vendor	07-Jun-09	1000 ug/mL	0.1
08D0085	Scandium	Scandium	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.2

Anne Spradlin 4/16/09
Prepared By Date

DT 4/22/09
Reviewed By Date

Analytical Standard Summary

09C0243

40

Description: S4
Standard Type: Calibration Standard
Solvent: 2%HNO3 5%HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 192-264-4
Prepared: 23-Mar-09
Expires: 19-Sep-09

Comments:

Analyte	CAS Number	Concentration	Units
Cerium	7440-45-1	1	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08F0352	Cerium	Cerium	23-Jun-08	Vendor	12-Dec-09	1000 ug/mL	1

Anne Spradlin 3/23/09
Prepared By Date

DG 03/26/2009
Reviewed By Date

Analytical Standard Summary

09C0224

41

Description: S5
Standard Type: Calibration Standard
Solvent: 2%HNO3 5%HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 192-259-13
Prepared: 21-Mar-09
Expires: 15-Jul-09

Comments:

Analyte	CAS Number	Concentration	Units
Uranium	7440-61-1	2	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08A0058	Uranium	Uranium	28-Jan-08	Vendor	15-Jul-09	1000 ug/mL	2

Anne Spradlin 3/21/09
Prepared By Date

DG 03/26/2009
Reviewed By Date

Analytical Standard Summary

09D0346

42

Description: ICV/CCV
Standard Type: Calibration Standard
Solvent: 2%HNO3/5%HCL
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 08E0063
Prepared: 23-Apr-09
Expires: 15-Jul-09

Comments: OPT 1 & 5

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	2	ug/mL
Antimony	7440-36-0	2	ug/mL
Arsenic	7440-38-2	2	ug/mL
Barium	7440-39-3	2	ug/mL
Beryllium	7440-41-7	2	ug/mL
Bismuth	7440-69-9	4	ug/mL
Boron	7440-42-8	2	ug/mL
Cadmium	7440-43-9	2	ug/mL
Calcium	7440-70-2	2	ug/mL
Chromium	7440-47-3	2	ug/mL
Cobalt	7440-48-4	2	ug/mL
Copper	7440-50-8	2	ug/mL
Gallium	7440-55-3	4	ug/mL
Iron	7439-89-6	2	ug/mL
Lanthanum	7439-91-0	4	ug/mL
Lead	7439-92-1	2	ug/mL
Lithium	7439-93-2	4	ug/mL
Magnesium	7439-95-4	2	ug/mL
Manganese	7439-96-5	2	ug/mL
Molybdenum	7439-98-7	2	ug/mL
Nickel	7440-02-0	2	ug/mL
Phosphorus	7723-14-0	10	ug/mL
Potassium	7440-09-7	20	ug/mL
Scandium	7440-20-2	1	ug/mL
Selenium	7782-49-2	2	ug/mL
Silica (SiO2)	7631-86-9	21.4	ug/mL
Silicon	7440-21-3	10	ug/mL
Silver	7440-22-4	2	ug/mL
Sodium	7440-23-5	20	ug/mL
Strontium	7440-24-6	2	ug/mL
Thallium	7440-28-0	2	ug/mL
Tin	7440-31-5	4	ug/mL
Titanium	7440-32-6	2	ug/mL
Uranium	7440-61-1	1	ug/mL
Vanadium	7440-62-2	2	ug/mL
Zirconium	7440-66-6	2	ug/mL

Analytical Standard Summary

09D0346

43

Parent Standards used in this standard:

ndard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0111	Lanthanum	Lanthanum	12-Jan-09	Vendor	30-Jun-10	10000 ug/mL	0.4
08C0081	Uranium	Uranium	10-Mar-08	Vendor	29-Aug-09	1000 ug/mL	1
08J0545	Strontium	Strontium	30-Oct-08	Vendor	21-Apr-10	10000 ug/mL	0.2
08J0536	QCS-26 (0816541)	Beryllium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Iron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Cobalt	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Chromium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Calcium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Magnesium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Boron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Lead	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Barium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Arsenic	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Antimony	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Aluminum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Cadmium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Thallium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Zinc	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Copper	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Titanium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Manganese	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Silver	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Silicon	30-Oct-08	Vendor	16-Oct-09	50 ug/mL	20
08J0536	QCS-26 (0816541)	Silica (SiO2)	30-Oct-08	Vendor	16-Oct-09	107 ug/mL	20
08J0536	QCS-26 (0816541)	Selenium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
0536	QCS-26 (0816541)	Potassium	30-Oct-08	Vendor	16-Oct-09	1000 ug/mL	20
0536	QCS-26 (0816541)	Nickel	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Molybdenum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Vanadium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0544	Phosphorous	Phosphorus	30-Oct-08	Vendor	16-Apr-10	10000 ug/mL	1
08J0546	Tin	Tin	30-Oct-08	Vendor	16-Apr-10	10000 ug/mL	0.4
08A0060	Sodium	Sodium	28-Jan-08	Vendor	15-Jul-09	10000 ug/mL	1.8
08D0086	Lithium	Lithium	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.4
08D0085	Scandium	Scandium	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.1
08D0084	Bismuth	Bismuth	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.4
08D0083	Gallium	Gallium	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.4

Anne Spadler 4/24/09

Prepared By Date

DG 04/23/09

Reviewed By Date

Analytical Standard Summary

09D0182

44

Description: CRI SOLUTION
Standard Type: Calibration Standard
Solvent: 2%HNO3/5%HCL
Final Volume 500
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 08D0147
Prepared: 16-Apr-09
Expires: 07-Jun-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	0.08	ug/mL
Antimony	7440-36-0	0.02	ug/mL
Arsenic	7440-38-2	0.025	ug/mL
Barium	7440-39-3	0.004	ug/mL
Beryllium	7440-41-7	0.002	ug/mL
Bismuth	7440-69-9	0.06	ug/mL
Boron	7440-42-8	0.04	ug/mL
Cadmium	7440-43-9	0.002	ug/mL
Calcium	7440-70-2	0.04	ug/mL
Chromium	7440-47-3	0.006	ug/mL
Cobalt	7440-48-4	0.006	ug/mL
Copper	7440-50-8	0.01	ug/mL
Gallium	7440-55-3	0.02	ug/mL
Hydrochloric Acid	7647-01-0	7.5	ug/mL
Iron	7439-89-6	0.06	ug/mL
Lanthanum	7439-91-0	0.005	ug/mL
Lead	7439-92-1	0.0075	ug/mL
Lithium	7439-93-2	0.02	ug/mL
Magnesium	7439-95-4	0.06	ug/mL
Manganese	7439-96-5	0.004	ug/mL
Molybdenum	7439-98-7	0.008	ug/mL
Nickel	7440-02-0	0.01	ug/mL
Phosphorus	7723-14-0	0.05	ug/mL
Potassium	7440-09-7	0.5	ug/mL
Scandium	7440-20-2	0.002	ug/mL
Selenium	7782-49-2	0.04	ug/mL
Silica (SiO2)	7631-86-9	0.171	ug/mL
Silicon	7440-21-3	0.08	ug/mL
Silver	7440-22-4	0.005	ug/mL
Sodium	7440-23-5	0.5	ug/mL
Strontium	7440-24-6	0.005	ug/mL
Thallium	7440-28-0	0.015	ug/mL
Tin	7440-31-5	0.05	ug/mL
Titanium	7440-32-6	0.005	ug/mL
Uranium	7440-61-1	0.02	ug/mL
Vanadium	7440-62-2	0.005	ug/mL
Zinc	7440-66-6	0.01	ug/mL

Analytical Standard Summary

09D0182

45

Parent Standards used in this standard:

dard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0293	CRI STOCK	Calcium	26-Jan-09	Anne Spradlin	07-Jun-09	4 ug/mL	5
09A0293	CRI STOCK	Lead	26-Jan-09	Anne Spradlin	07-Jun-09	0.75 ug/mL	5
09A0293	CRI STOCK	Lanthanum	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5
09A0293	CRI STOCK	Iron	26-Jan-09	Anne Spradlin	07-Jun-09	6 ug/mL	5
09A0293	CRI STOCK	Hydrochloric Ac	26-Jan-09	Anne Spradlin	07-Jun-09	750 ug/mL	5
09A0293	CRI STOCK	Gallium	26-Jan-09	Anne Spradlin	07-Jun-09	2 ug/mL	5
09A0293	CRI STOCK	Copper	26-Jan-09	Anne Spradlin	07-Jun-09	1 ug/mL	5
09A0293	CRI STOCK	Aluminum	26-Jan-09	Anne Spradlin	07-Jun-09	8 ug/mL	5
09A0293	CRI STOCK	Chromium	26-Jan-09	Anne Spradlin	07-Jun-09	0.6 ug/mL	5
09A0293	CRI STOCK	Manganese	26-Jan-09	Anne Spradlin	07-Jun-09	0.4 ug/mL	5
09A0293	CRI STOCK	Cadmium	26-Jan-09	Anne Spradlin	07-Jun-09	0.2 ug/mL	5
09A0293	CRI STOCK	Boron	26-Jan-09	Anne Spradlin	07-Jun-09	4 ug/mL	5
09A0293	CRI STOCK	Bismuth	26-Jan-09	Anne Spradlin	07-Jun-09	6 ug/mL	5
09A0293	CRI STOCK	Beryllium	26-Jan-09	Anne Spradlin	07-Jun-09	0.2 ug/mL	5
09A0293	CRI STOCK	Barium	26-Jan-09	Anne Spradlin	07-Jun-09	0.4 ug/mL	5
09A0293	CRI STOCK	Arsenic	26-Jan-09	Anne Spradlin	07-Jun-09	2.5 ug/mL	5
09A0293	CRI STOCK	Antimony	26-Jan-09	Anne Spradlin	07-Jun-09	2 ug/mL	5
09A0293	CRI STOCK	Cobalt	26-Jan-09	Anne Spradlin	07-Jun-09	0.6 ug/mL	5
09A0293	CRI STOCK	Silica (SiO2)	26-Jan-09	Anne Spradlin	07-Jun-09	17.1 ug/mL	5
09A0293	CRI STOCK	Vanadium	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5
09A0293	CRI STOCK	Uranium	26-Jan-09	Anne Spradlin	07-Jun-09	2 ug/mL	5
09A0293	CRI STOCK	Titanium	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5
09A0293	CRI STOCK	Tin	26-Jan-09	Anne Spradlin	07-Jun-09	5 ug/mL	5
09A0293	CRI STOCK	Thallium	26-Jan-09	Anne Spradlin	07-Jun-09	1.5 ug/mL	5
09A0293	CRI STOCK	Strontium	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5
09A0293	CRI STOCK	Sodium	26-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	5
09A0293	CRI STOCK	Lithium	26-Jan-09	Anne Spradlin	07-Jun-09	2 ug/mL	5
09A0293	CRI STOCK	Silicon	26-Jan-09	Anne Spradlin	07-Jun-09	8 ug/mL	5
09A0293	CRI STOCK	Magnesium	26-Jan-09	Anne Spradlin	07-Jun-09	6 ug/mL	5
09A0293	CRI STOCK	Selenium	26-Jan-09	Anne Spradlin	07-Jun-09	4 ug/mL	5
09A0293	CRI STOCK	Scandium	26-Jan-09	Anne Spradlin	07-Jun-09	0.2 ug/mL	5
09A0293	CRI STOCK	Potassium	26-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	5
09A0293	CRI STOCK	Phosphorus	26-Jan-09	Anne Spradlin	07-Jun-09	5 ug/mL	5
09A0293	CRI STOCK	Nickel	26-Jan-09	Anne Spradlin	07-Jun-09	1 ug/mL	5
09A0293	CRI STOCK	Molybdenum	26-Jan-09	Anne Spradlin	07-Jun-09	0.8 ug/mL	5
09A0293	CRI STOCK	Zinc	26-Jan-09	Anne Spradlin	07-Jun-09	1 ug/mL	5
09A0293	CRI STOCK	Silver	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5

Anne Spradlin 4/16/09
Prepared By Date

DT 4/22/09
Reviewed By Date

Analytical Standard Summary

09D0295

46

Description: ICSA
Standard Type: Calibration Standard
Solvent: 2%HNO3 5%HCl
Final Volume 200
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 88E
Prepared: 22-Apr-09
Expires: 07-Jun-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	500	mg/L
Calcium	7440-70-2	500	mg/L
Chromium	7440-47-3	10	mg/L
Copper	7440-50-8	10	mg/L
Iron	7439-89-6	200	mg/L
Magnesium	7439-95-4	500	mg/L
Manganese	7439-96-5	10	mg/L
Nickel	7440-02-0	10	mg/L
Titanium	7440-32-6	10	mg/L
Vanadium	7440-62-2	10	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0118	Manganese	Manganese	12-Jan-09	Vendor	30-Jun-10	1000 ug/mL	2
09A0117	Nickel	Nickel	12-Jan-09	Vendor	30-Jun-10	1000 ug/mL	2
09A0116	Titanium	Titanium	12-Jan-09	Vendor	30-Jun-10	1000 ug/mL	2
0538	CLP-INF-1 (0805302)	Magnesium	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Iron	30-Oct-08	Vendor	16-Oct-09	2000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Calcium	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Aluminum	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08E0345	Vanadium	Vanadium	22-Jun-08	Vendor	12-Dec-09	1000 ug/mL	2
07L0014	Copper	Copper	14-Dec-07	Vendor	07-Jun-09	1000 ug/mL	2
07L0013	Chromium	Chromium	14-Dec-07	Vendor	07-Jun-09	1000 ug/mL	2

Anne Spradlin 4/22/09
Prepared By Date

DG 04/22/09
Reviewed By Date

Analytical Standard Summary

09D0296

47

Description: ICSAB SOLUTION
Standard Type: Calibration Standard
Solvent: 2%HNO3/5%HCL
Final Volume 200
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 08E0060
Prepared: 22-Apr-09
Expires: 07-Jun-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	500	mg/L
Antimony	7440-36-0	0.5	mg/L
Arsenic	7440-38-2	0.5	mg/L
Barium	7440-39-3	0.5	mg/L
Beryllium	7440-41-7	0.5	mg/L
Cadmium	7440-43-9	0.5	mg/L
Calcium	7440-70-2	500	mg/L
Chromium	7440-47-3	0.5	mg/L
Cobalt	7440-48-4	0.5	mg/L
Copper	7440-50-8	0.5	mg/L
Iron	7439-89-6	200	mg/L
Lead	7439-92-1	0.5	mg/L
Magnesium	7439-95-4	500	mg/L
Manganese	7439-96-5	0.5	mg/L
Nickel	7440-02-0	0.5	mg/L
Selenium	7782-49-2	0.5	mg/L
Silver	7440-22-4	0.5	mg/L
Thallium	7440-28-0	0.5	mg/L
nium	7440-61-1	0.5	mg/L
anadium	7440-62-2	0.5	mg/L
Zinc	7440-66-6	0.5	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08J0538	CLP-INF-1 (0805302)	Calcium	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Iron	30-Oct-08	Vendor	16-Oct-09	2000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Magnesium	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Aluminum	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
09A0309	ICSAB STOCK	Cobalt	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Antimony	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Arsenic	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Barium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Beryllium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Chromium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Zinc	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Copper	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Lead	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Manganese	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Nickel	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Selenium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Thallium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Uranium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Vanadium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
0309	ICSAB STOCK	Cadmium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
0184	Silver	Silver	13-Nov-08	Vendor	04-May-10	1000 ug/mL	0.1

Anne Spradlin 4/22/09
Prepared By Date

DG 04/22/09
Reviewed By Date

ICP CONTROL SHEET

Instrument: Optima 1 Date: 04/28/09 Data File: 09118A

Operator: DT Time: 814

Sample	Time	Elements Out of Control	Comments	Batch
ICV 5% 200.7	854	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		W917163
ICV 10% 6010B		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		W917169
ICB	900	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CRI		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
ICSA	911	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
ICSB		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV1	924	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB1		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV2	1109	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB2		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV3	1207	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB3		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV4	1330	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB4		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV5		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB5		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV6		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB6		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV7		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB7		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV8		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB8		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV9		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB9		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV10		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB10		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		

Analysis Begun

Start Time: 4/28/2009 8:14:56 AM
Logged In Analyst: optima1
Spectrometer Model: Optima 4300 DV, S/N 077N0061602
Plasma On Time: 4/28/2009 6:35:00 AM
Technique: ICP Continuous
Autosampler Model: AS-93plus

Sample Information File: C:\pe\Optima1\Sample Information\START.sif
Batch ID: W916237
Results Data Set: 09118A
Results Library: C:\pe\Optima1\Results\Results.mdb

Method Loaded
Method Name: OPT1
IEC File: OPT1.iec
Method Description:
Method Last Saved: 4/7/2009 7:08:49 AM
MSF File:

Sequence No.: 1
Sample ID: Calib Blank 1
Analyst:
Initial Sample Wt:
Dilution:
Autosampler Location: 1
Date Collected: 4/28/2009 8:14:57 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: Calib Blank 1

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	61527.0	38.56	0.06%	100.000	%
Lu 261.542 A	696912.1	502.57	0.07%	100.000	%
Ag 328.068†	-147.5	9.68	6.56%	[0.00]	mg/L
Al 308.215 †	44.1	4.33	9.83%	[0.00]	mg/L
As 188.979†	-9.8	1.06	10.78%	[0.00]	mg/L
B 249.677†	3.3	0.18	5.47%	[0.00]	mg/L
Ba 233.527 A†	-382.3	0.25	0.07%	[0.00]	mg/L
Be 313.107 R†	15.6	1.99	12.78%	[0.00]	mg/L
Bi 222.821†	-49.7	5.41	10.88%	[0.00]	mg/L
Ca 315.887 †	17.0	5.76	33.84%	[0.00]	mg/L
Cd 226.502†	-14.4	2.29	15.87%	[0.00]	mg/L
Ce 418.660†	-166.1	10.90	6.56%	[0.00]	mg/L
Co 228.616†	-21.3	0.96	4.54%	[0.00]	mg/L
Cr 267.716†	64.1	1.44	2.24%	[0.00]	mg/L
Cu 324.752†	9508.2	81.02	0.85%	[0.00]	mg/L
Fe 273.955 †	-44.8	0.40	0.88%	[0.00]	mg/L
Ga 417.206†	121.0	3.82	3.16%	[0.00]	mg/L
K 766.490 †	133.7	3.38	2.53%	[0.00]	mg/L
La 379.478†	-602.8	21.09	3.50%	[0.00]	mg/L
Li 670.784†	909.2	12.11	1.33%	[0.00]	mg/L
Mg 279.077 †	4.5	1.35	29.92%	[0.00]	mg/L
Mn 260.568†	-25.9	0.89	3.45%	[0.00]	mg/L
Mo 202.031†	2.1	0.62	30.11%	[0.00]	mg/L
Na 589.592†	74.9	1.50	2.00%	[0.00]	mg/L
Ni 232.003†	-38.6	1.35	3.50%	[0.00]	mg/L
P 213.617†	-2.7	0.26	9.76%	[0.00]	mg/L
Pb 220.353†	17.2	0.29	1.72%	[0.00]	mg/L
Sb 206.836†	6.4	0.52	8.22%	[0.00]	mg/L
Sc 361.383†	31.6	9.80	31.04%	[0.00]	mg/L
Se 196.026†	-24.4	1.91	7.83%	[0.00]	mg/L
Si 251.611†	15.5	0.70	4.54%	[0.00]	mg/L
SIO2 251.611†	15.5	0.70	4.54%	[0.00]	mg/L
Sn 189.927†	-6.0	0.77	12.84%	[0.00]	mg/L
Sr 421.552†	-9.3	3.64	39.17%	[0.00]	mg/L
Ti 336.121†	-372.7	8.18	2.20%	[0.00]	mg/L
Tl 190.801†	-18.4	0.26	1.43%	[0.00]	mg/L
U 385.958†	481.4	4.84	1.01%	[0.00]	mg/L
V 292.402†	-11.8	3.01	25.43%	[0.00]	mg/L
Zn 206.200†	21.5	1.05	4.91%	[0.00]	mg/L

Sequence No.: 2
Sample ID: STD1
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 2
Date Collected: 4/28/2009 8:20:57 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD1

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	61193.4	311.14	0.51%	99.4579	%
Lu 261.542 A	707264.1	509.12	0.07%	101.485	%
Ag 328.068†	207462.7	63.62	0.03%	[3]	mg/L
As 188.979†	2634.8	11.21	0.43%	[3]	mg/L
B 249.677†	2034.5	2.10	0.10%	[3]	mg/L
Ba 233.527 A†	338923.8	502.04	0.15%	[3]	mg/L
Be 313.107 R†	120450.4	369.56	0.31%	[3]	mg/L
Bi 222.821†	3713.3	4.42	0.12%	[5]	mg/L
Cd 226.502†	14412.7	28.78	0.20%	[3]	mg/L
Co 228.616†	75057.5	138.74	0.18%	[3]	mg/L
Cr 267.716†	25882.8	44.71	0.17%	[3]	mg/L
Cu 324.752†	799317.5	5843.27	0.73%	[3]	mg/L
Ga 417.206†	343850.3	3864.34	1.12%	[5]	mg/L
K 766.490 †	67044.7	424.59	0.63%	[30]	mg/L
Li 670.784†	769126.8	449.35	0.06%	[8]	mg/L
Mn 260.568†	45998.0	51.54	0.11%	[3]	mg/L
Mo 202.031†	4589.2	3.53	0.08%	[3]	mg/L
Ni 232.003†	14489.2	47.79	0.33%	[3]	mg/L
P 213.617†	4105.5	3.58	0.09%	[10]	mg/L
Pb 220.353†	2847.7	3.82	0.13%	[3]	mg/L
Sb 206.836†	6088.5	5.23	0.09%	[3]	mg/L
Se 196.026†	2240.0	0.22	0.01%	[3]	mg/L
Sn 189.927†	3516.0	9.27	0.26%	[5]	mg/L
Sr 421.552†	1372528.7	265.77	0.02%	[5]	mg/L
Ti 336.121†	1101120.5	3183.98	0.29%	[3]	mg/L
Tl 190.801†	2586.8	9.38	0.36%	[3]	mg/L
V 292.402†	47192.8	22.77	0.05%	[3]	mg/L
Zn 206.200†	17797.0	51.29	0.29%	[3]	mg/L

Sequence No.: 3
Sample ID: STD2
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 3
Date Collected: 4/28/2009 8:26:44 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD2

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	63080.1	507.73	0.80%	102.524	%
Lu 261.542 A	700742.8	1589.37	0.23%	100.550	%
Al 308.215 †	97576.8	254.04	0.26%	[50]	mg/L
Ca 315.887 †	177951.7	161.40	0.09%	[50]	mg/L
Fe 273.955 †	54434.7	54.82	0.10%	[50]	mg/L
Mg 279.077 †	21734.0	33.44	0.15%	[50]	mg/L
Na 589.592†	260278.8	3152.11	1.21%	[50]	mg/L

Sequence No.: 4
Sample ID: STD3
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 4
Date Collected: 4/28/2009 8:31:52 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD3

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	64365.7	281.30	0.44%	104.614	%
Lu 261.542 A	719463.1	2024.49	0.28%	103.236	%
La 379.478†	1376861.7	1294.79	0.09%	[10]	mg/L
Sc 361.383†	2114434.2	795.90	0.04%	[2]	mg/L
Si 251.611†	40472.2	64.67	0.16%	[25]	mg/L
SIO2 251.611†	40472.2	64.67	0.16%	[53.5]	mg/L

Sequence No.: 5
Sample ID: STD4
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 5
Date Collected: 4/28/2009 8:36:00 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD4

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	63367.9	140.07	0.22%	102.992	%
Lu 261.542 A	718443.8	1766.78	0.25%	103.090	%
Ce 418.660†	36640.8	107.51	0.29%	[1]	mg/L

Sequence No.: 6
Sample ID: STD5
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 14
Date Collected: 4/28/2009 8:40:02 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD5

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	63068.1	928.56	1.47%	102.505	%
Lu 261.542 A	711979.7	262.15	0.04%	102.162	%
U 385.958†	7980.1	21.96	0.28%	[2.0]	mg/L

Calibration Summary

Analyte	Stds.	Equation	Intercept	Slope	Curvature	Corr. Coef.	Reslope
Ag 328.068	1	Lin, Calc Int	-0.0	69150	0.00000	1.000000	
Al 308.215	1	Lin, Calc Int	0.0	1952	0.00000	1.000000	
As 188.979	1	Lin, Calc Int	0.0	878.3	0.00000	1.000000	
B 249.677	1	Lin, Calc Int	0.0	678.2	0.00000	1.000000	
Ba 233.527 A	1	Lin, Calc Int	0.0	113000	0.00000	1.000000	
Be 313.107 R	1	Lin, Calc Int	-0.0	40150	0.00000	1.000000	
Bi 222.821	1	Lin, Calc Int	-0.0	742.7	0.00000	1.000000	
Ca 315.887	1	Lin, Calc Int	-0.0	3559	0.00000	1.000000	
Cd 226.502	1	Lin, Calc Int	0.0	4804	0.00000	1.000000	
Ce 418.660	1	Lin, Calc Int	0.0	36640	0.00000	1.000000	
Co 228.616	1	Lin, Calc Int	0.0	25020	0.00000	1.000000	
Cr 267.716	1	Lin, Calc Int	0.0	8628	0.00000	1.000000	
Cu 324.752	1	Lin, Calc Int	0.0	266400	0.00000	1.000000	
Fe 273.955	1	Lin, Calc Int	0.0	1089	0.00000	1.000000	
Ga 417.206	1	Lin, Calc Int	0.0	68770	0.00000	1.000000	
K 766.490	1	Lin, Calc Int	0.0	2235	0.00000	1.000000	
La 379.478	1	Lin, Calc Int	0.0	137700	0.00000	1.000000	
Li 670.784	1	Lin, Calc Int	0.0	96140	0.00000	1.000000	
Mg 279.077	1	Lin, Calc Int	0.0	434.7	0.00000	1.000000	
Mn 260.568	1	Lin, Calc Int	0.0	15330	0.00000	1.000000	
Mo 202.031	1	Lin, Calc Int	0.0	1530	0.00000	1.000000	
Na 589.592	1	Lin, Calc Int	0.0	5206	0.00000	1.000000	
Ni 232.003	1	Lin, Calc Int	0.0	4830	0.00000	1.000000	
P 213.617	1	Lin, Calc Int	0.0	410.6	0.00000	1.000000	
Pb 220.353	1	Lin, Calc Int	0.0	949.2	0.00000	1.000000	
Sb 206.836	1	Lin, Calc Int	-0.0	2029	0.00000	1.000000	
Sc 361.383	1	Lin, Calc Int	0.0	1057000	0.00000	1.000000	
Se 196.026	1	Lin, Calc Int	0.0	746.7	0.00000	1.000000	
Si 251.611	1	Lin, Calc Int	0.0	1619	0.00000	1.000000	
SIO2 251.611	1	Lin, Calc Int	-0.0	756.5	0.00000	1.000000	
Sn 189.927	1	Lin, Calc Int	-0.0	703.2	0.00000	1.000000	
Sr 421.552	1	Lin, Calc Int	0.0	274500	0.00000	1.000000	
Ti 336.121	1	Lin, Calc Int	0.0	367000	0.00000	1.000000	
Tl 190.801	1	Lin, Calc Int	0.0	862.3	0.00000	1.000000	
U 385.958	1	Lin, Calc Int	0.0	3990	0.00000	1.000000	
V 292.402	1	Lin, Calc Int	-0.0	15730	0.00000	1.000000	
Zn 206.200	1	Lin, Calc Int	0.0	5932	0.00000	1.000000	

Sequence No.: 7
Sample ID: ICV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 6
Date Collected: 4/28/2009 8:44:01 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ICV

Analyte	Mean Corrected Intensity	Calib Conc.	Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	62499.3	101.580	%	0.5080				0.50%
Lu 261.542 A	706929.2	101.437	%	0.2121				0.21%
Ag 328.068†	142119.7	2.05433	mg/L	0.000909	2.05433	mg/L	0.000909	0.04%
QC value within limits for Ag 328.068 Recovery = 102.72%								
Al 308.215 †	4183.2	2.12055	mg/L	0.015131	2.12055	mg/L	0.015131	0.71%
QC value greater than the upper limit for Al 308.215 Recovery = 106.03%								
As 188.979†	1947.2	2.06894	mg/L	0.004023	2.06894	mg/L	0.004023	0.19%
QC value within limits for As 188.979 Recovery = 103.45%								
B 249.677†	1400.3	2.06038	mg/L	0.017948	2.06038	mg/L	0.017948	0.87%
QC value within limits for B 249.677 Recovery = 103.02%								
Ba 233.527 A†	233236.0	2.07671	mg/L	0.002003	2.07671	mg/L	0.002003	0.10%
QC value within limits for Ba 233.527 A Recovery = 103.84%								
Be 313.107 R†	78288.8	1.95025	mg/L	0.018756	1.95025	mg/L	0.018756	0.96%
QC value within limits for Be 313.107 R Recovery = 97.51%								
Bi 222.821†	2938.7	3.89300	mg/L	0.000758	3.89300	mg/L	0.000758	0.02%
QC value within limits for Bi 222.821 Recovery = 97.32%								
Ca 315.887 †	7537.8	2.10366	mg/L	0.012289	2.10366	mg/L	0.012289	0.58%
QC value within limits for Ca 315.887 Recovery = 105.18%								
Cd 226.502†	9844.8	2.05067	mg/L	0.006793	2.05067	mg/L	0.006793	0.33%
QC value within limits for Cd 226.502 Recovery = 102.53%								
Ce 418.660†	-379.3	-0.001201	mg/L	0.0001021	-0.001201	mg/L	0.0001021	8.50%
Co 228.616†	52163.0	2.08071	mg/L	0.002215	2.08071	mg/L	0.002215	0.11%
QC value within limits for Co 228.616 Recovery = 104.04%								
Cr 267.716†	17626.5	2.04134	mg/L	0.003730	2.04134	mg/L	0.003730	0.18%
QC value within limits for Cr 267.716 Recovery = 102.07%								
Cu 324.752†	544571.6	2.04151	mg/L	0.000338	2.04151	mg/L	0.000338	0.02%
QC value within limits for Cu 324.752 Recovery = 102.08%								
Fe 273.955 †	2263.7	2.08128	mg/L	0.013121	2.08128	mg/L	0.013121	0.63%
QC value within limits for Fe 273.955 Recovery = 104.06%								
Ga 417.206†	274703.9	3.99057	mg/L	0.004661	3.99057	mg/L	0.004661	0.12%
QC value within limits for Ga 417.206 Recovery = 99.76%								
K 766.490 †	44304.4	19.8245	mg/L	0.27426	19.8245	mg/L	0.27426	1.38%
QC value within limits for K 766.490 Recovery = 99.12%								
La 379.478†	544786.4	3.94770	mg/L	0.003036	3.94770	mg/L	0.003036	0.08%
QC value within limits for La 379.478 Recovery = 98.69%								
Li 670.784†	371741.3	3.86618	mg/L	0.029133	3.86618	mg/L	0.029133	0.75%
QC value within limits for Li 670.784 Recovery = 96.65%								
Mg 279.077 †	902.6	2.11130	mg/L	0.001661	2.11130	mg/L	0.001661	0.08%
QC value greater than the upper limit for Mg 279.077 Recovery = 105.57%								
Mn 260.568†	31269.4	2.03861	mg/L	0.015095	2.03861	mg/L	0.015095	0.74%
QC value within limits for Mn 260.568 Recovery = 101.93%								
Mo 202.031†	3138.5	2.05165	mg/L	0.006668	2.05165	mg/L	0.006668	0.33%
QC value within limits for Mo 202.031 Recovery = 102.58%								
Na 589.592†	110286.2	21.1862	mg/L	0.02003	21.1862	mg/L	0.02003	0.09%
QC value greater than the upper limit for Na 589.592 Recovery = 105.93%								
Ni 232.003†	10194.0	2.05600	mg/L	0.000460	2.05600	mg/L	0.000460	0.02%
QC value within limits for Ni 232.003 Recovery = 102.80%								
P 213.617†	3918.3	9.52879	mg/L	0.011303	9.52879	mg/L	0.011303	0.12%
QC value within limits for P 213.617 Recovery = 95.29%								
Pb 220.353†	1901.5	2.00471	mg/L	0.007224	2.00471	mg/L	0.007224	0.36%
QC value within limits for Pb 220.353 Recovery = 100.24%								
Sb 206.836†	4179.1	2.05481	mg/L	0.011039	2.05481	mg/L	0.011039	0.54%
QC value within limits for Sb 206.836 Recovery = 102.74%								
Sc 361.383†	1054345.1	0.996915	mg/L	0.0012666	0.996915	mg/L	0.0012666	0.13%
QC value within limits for Sc 361.383 Recovery = 99.69%								
Se 196.026†	1530.3	2.06123	mg/L	0.003273	2.06123	mg/L	0.003273	0.16%
QC value within limits for Se 196.026 Recovery = 103.06%								
Si 251.611†	16226.3	9.96990	mg/L	0.041560	9.96990	mg/L	0.041560	0.42%
QC value within limits for Si 251.611 Recovery = 99.70%								
SIO2 251.611†	16226.3	21.3408	mg/L	0.08893	21.3408	mg/L	0.08893	0.42%

QC value within limits for SIO2 251.611 Recovery = 99.72%						
Sn 189.927†	2833.3	4.03250 mg/L	0.008370	4.03250 mg/L	0.008370	0.21%
QC value within limits for Sn 189.927 Recovery = 100.81%						
Sr 421.552†	543148.3	1.97862 mg/L	0.016161	1.97862 mg/L	0.016161	0.82%
QC value within limits for Sr 421.552 Recovery = 98.93%						
Ti 336.121†	816542.3	2.06939 mg/L	0.002083	2.06939 mg/L	0.002083	0.10%
QC value within limits for Ti 336.121 Recovery = 103.47%						
Tl 190.801†	1764.9	2.04727 mg/L	0.004370	2.04727 mg/L	0.004370	0.21%
QC value within limits for Tl 190.801 Recovery = 102.36%						
U 385.958†	4441.2	0.926471 mg/L	0.0054430	0.926471 mg/L	0.0054430	0.59%
V 292.402†	32200.6	2.06252 mg/L	0.000120	2.06252 mg/L	0.000120	0.01%
QC value within limits for V 292.402 Recovery = 103.13%						
Zn 206.200†	12104.7	2.03677 mg/L	0.001036	2.03677 mg/L	0.001036	0.05%
QC value within limits for Zn 206.200 Recovery = 101.84%						

QC Failed. Continue with analysis.

Sequence No.: 8
Sample ID: ICB
Analyst:
Initial Sample Wt:
Dilution:
User canceled analysis.

Autosampler Location: 1
Date Collected: 4/28/2009 8:49:52 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Analysis Begun

Start Time: 4/28/2009 8:54:36 AM
Logged In Analyst: optima1
Spectrometer Model: Optima 4300 DV, S/N 077N0061602

Plasma On Time: 4/28/2009 6:35:00 AM
Technique: ICP Continuous
Autosampler Model: AS-93plus

Sample Information File: C:\pe\Optima1\Sample Information\START.sif
Batch ID: W916237
Results Data Set: 09118A
Results Library: C:\pe\Optima1\Results\Results.mdb

Sequence No.: 7
Sample ID: ICV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 6
Date Collected: 4/28/2009 8:54:36 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ICV

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	64408.0	104.683	%	0.2779				0.27%
Lu 261.542 A	721633.1	103.547	%	0.0932				0.09%
Ag 328.068†	139140.9	2.01131	mg/L	0.010158	2.01131	mg/L	0.010158	0.51%
QC value within limits for Ag 328.068 Recovery = 100.57%								
Al 308.215 †	4089.3	2.07249	mg/L	0.012829	2.07249	mg/L	0.012829	0.62%
QC value within limits for Al 308.215 Recovery = 103.62%								
As 188.979†	1930.0	2.05126	mg/L	0.003843	2.05126	mg/L	0.003843	0.19%
QC value within limits for As 188.979 Recovery = 102.56%								
B 249.677†	1376.5	2.02527	mg/L	0.007830	2.02527	mg/L	0.007830	0.39%
QC value within limits for B 249.677 Recovery = 101.26%								
Ba 233.527 A†	228772.7	2.03698	mg/L	0.007999	2.03698	mg/L	0.007999	0.39%
QC value within limits for Ba 233.527 A Recovery = 101.85%								
Be 313.107 R†	76973.2	1.91747	mg/L	0.016773	1.91747	mg/L	0.016773	0.87%
QC value within limits for Be 313.107 R Recovery = 95.87%								
Bi 222.821†	2898.4	3.83931	mg/L	0.021278	3.83931	mg/L	0.021278	0.55%
QC value within limits for Bi 222.821 Recovery = 95.98%								
Ca 315.887 †	7365.9	2.05590	mg/L	0.011617	2.05590	mg/L	0.011617	0.57%
QC value within limits for Ca 315.887 Recovery = 102.79%								
Cd 226.502†	9733.7	2.02753	mg/L	0.010488	2.02753	mg/L	0.010488	0.52%
QC value within limits for Cd 226.502 Recovery = 101.38%								
Ce 418.660†	-369.2	-0.001086	mg/L	0.0002353	-0.001086	mg/L	0.0002353	21.66%
Co 228.616†	51486.7	2.05374	mg/L	0.007400	2.05374	mg/L	0.007400	0.36%
QC value within limits for Co 228.616 Recovery = 102.69%								
Cr 267.716†	17493.9	2.02604	mg/L	0.007499	2.02604	mg/L	0.007499	0.37%
QC value within limits for Cr 267.716 Recovery = 101.30%								
Cu 324.752†	539180.4	2.02136	mg/L	0.014529	2.02136	mg/L	0.014529	0.72%
QC value within limits for Cu 324.752 Recovery = 101.07%								
Fe 273.955 †	2224.9	2.04547	mg/L	0.004796	2.04547	mg/L	0.004796	0.23%
QC value within limits for Fe 273.955 Recovery = 102.27%								
Ga 417.206†	270060.4	3.92315	mg/L	0.041187	3.92315	mg/L	0.041187	1.05%
QC value within limits for Ga 417.206 Recovery = 98.08%								
K 766.490 †	43385.1	19.4132	mg/L	0.20332	19.4132	mg/L	0.20332	1.05%
QC value within limits for K 766.490 Recovery = 97.07%								
La 379.478†	537399.3	3.89408	mg/L	0.005014	3.89408	mg/L	0.005014	0.13%
QC value within limits for La 379.478 Recovery = 97.35%								
Li 670.784†	365717.9	3.80354	mg/L	0.014502	3.80354	mg/L	0.014502	0.38%
QC value within limits for Li 670.784 Recovery = 95.09%								
Mg 279.077 †	887.5	2.07612	mg/L	0.005422	2.07612	mg/L	0.005422	0.26%
QC value within limits for Mg 279.077 Recovery = 103.81%								
Mn 260.568†	30607.2	1.99544	mg/L	0.013124	1.99544	mg/L	0.013124	0.66%

QC value within limits for Mn 260.568 Recovery = 99.77%						
Mo 202.031†	3077.8	2.01200 mg/L	0.013050	2.01200 mg/L	0.013050	0.65%
QC value within limits for Mo 202.031 Recovery = 100.60%						
Na 589.592†	108453.5	20.8341 mg/L	0.04900	20.8341 mg/L	0.04900	0.24%
QC value within limits for Na 589.592 Recovery = 104.17%						
Ni 232.003†	10102.1	2.03738 mg/L	0.000880	2.03738 mg/L	0.000880	0.04%
QC value within limits for Ni 232.003 Recovery = 101.87%						
P 213.617†	3855.3	9.37530 mg/L	0.016169	9.37530 mg/L	0.016169	0.17%
QC value less than the lower limit for P 213.617 Recovery = 93.75%						
Pb 220.353†	1870.2	1.97174 mg/L	0.008328	1.97174 mg/L	0.008328	0.42%
QC value within limits for Pb 220.353 Recovery = 98.59%						
Sb 206.836†	4112.5	2.02185 mg/L	0.011794	2.02185 mg/L	0.011794	0.58%
QC value within limits for Sb 206.836 Recovery = 101.09%						
Sc 361.383†	1036242.9	0.979800 mg/L	0.0001497	0.979800 mg/L	0.0001497	0.02%
QC value within limits for Sc 361.383 Recovery = 97.98%						
Se 196.026†	1511.4	2.03565 mg/L	0.008857	2.03565 mg/L	0.008857	0.44%
QC value within limits for Se 196.026 Recovery = 101.78%						
Si 251.611†	15903.6	9.77149 mg/L	0.037270	9.77149 mg/L	0.037270	0.38%
QC value within limits for Si 251.611 Recovery = 97.71%						
SIO2 251.611†	15903.6	20.9162 mg/L	0.07977	20.9162 mg/L	0.07977	0.38%
QC value within limits for SIO2 251.611 Recovery = 97.74%						
Sn 189.927†	2778.6	3.95465 mg/L	0.005515	3.95465 mg/L	0.005515	0.14%
QC value within limits for Sn 189.927 Recovery = 98.87%						
Sr 421.552†	533658.4	1.94405 mg/L	0.011168	1.94405 mg/L	0.011168	0.57%
QC value within limits for Sr 421.552 Recovery = 97.20%						
Ti 336.121†	804161.4	2.03833 mg/L	0.002282	2.03833 mg/L	0.002282	0.11%
QC value within limits for Ti 336.121 Recovery = 101.92%						
Tl 190.801†	1754.8	2.03534 mg/L	0.008693	2.03534 mg/L	0.008693	0.43%
QC value within limits for Tl 190.801 Recovery = 101.77%						
U 385.958†	4218.7	0.873923 mg/L	0.0045930	0.873923 mg/L	0.0045930	0.53%
V 292.402†	31972.7	2.04771 mg/L	0.001533	2.04771 mg/L	0.001533	0.07%
QC value within limits for V 292.402 Recovery = 102.39%						
Zn 206.200†	11997.2	2.01872 mg/L	0.009673	2.01872 mg/L	0.009673	0.48%
QC value within limits for Zn 206.200 Recovery = 100.94%						
QC Failed. Continue with analysis.						

Sequence No.: 8
Sample ID: ICB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 1
Date Collected: 4/28/2009 9:00:25 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ICB

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	64167.6	104.292	%	0.2794				0.27%
Lu 261.542 A	712896.5	102.294	%	0.2028				0.20%
Ag 328.068†	8.2	0.000126	mg/L	0.0001017	0.000126	mg/L	0.0001017	80.69%
QC value within limits for Ag 328.068 Recovery = Not calculated								
Al 308.215 †	-1.6	-0.000901	mg/L	0.0001337	-0.000901	mg/L	0.0001337	14.85%
QC value within limits for Al 308.215 Recovery = Not calculated								
As 188.979†	0.3	0.000366	mg/L	0.0008378	0.000366	mg/L	0.0008378	229.03%
QC value within limits for As 188.979 Recovery = Not calculated								
B 249.677†	3.9	0.005707	mg/L	0.0016057	0.005707	mg/L	0.0016057	28.13%
QC value within limits for B 249.677 Recovery = Not calculated								
Ba 233.527 A†	34.3	0.000312	mg/L	0.0000073	0.000312	mg/L	0.0000073	2.35%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 R†	3.3	0.000080	mg/L	0.0000338	0.000080	mg/L	0.0000338	42.07%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821†	6.2	0.008319	mg/L	0.0000943	0.008319	mg/L	0.0000943	1.13%
QC value within limits for Bi 222.821 Recovery = Not calculated								
Ca 315.887 †	-2.3	-0.000602	mg/L	0.0019065	-0.000602	mg/L	0.0019065	316.87%
QC value within limits for Ca 315.887 Recovery = Not calculated								
Cd 226.502†	-0.0	-0.000009	mg/L	0.0002718	-0.000009	mg/L	0.0002718	>999.9%
QC value within limits for Cd 226.502 Recovery = Not calculated								
Ce 418.660†	4.0	0.000114	mg/L	0.0000973	0.000114	mg/L	0.0000973	85.57%
Co 228.616†	4.0	0.000160	mg/L	0.0000383	0.000160	mg/L	0.0000383	23.95%
QC value within limits for Co 228.616 Recovery = Not calculated								
Cr 267.716†	2.7	0.000317	mg/L	0.0001274	0.000317	mg/L	0.0001274	40.16%
QC value within limits for Cr 267.716 Recovery = Not calculated								
Cu 324.752†	79.2	0.000303	mg/L	0.0004337	0.000303	mg/L	0.0004337	142.98%
QC value within limits for Cu 324.752 Recovery = Not calculated								
Fe 273.955 †	1.8	0.001624	mg/L	0.0005660	0.001624	mg/L	0.0005660	34.85%
QC value within limits for Fe 273.955 Recovery = Not calculated								
Ga 417.206†	35.9	0.000529	mg/L	0.0001008	0.000529	mg/L	0.0001008	19.06%
QC value within limits for Ga 417.206 Recovery = Not calculated								
K 766.490 †	7.0	0.003139	mg/L	0.0007506	0.003139	mg/L	0.0007506	23.92%
QC value within limits for K 766.490 Recovery = Not calculated								
La 379.478†	52.2	0.000373	mg/L	0.0000331	0.000373	mg/L	0.0000331	8.88%
QC value within limits for La 379.478 Recovery = Not calculated								
Li 670.784†	396.7	0.004126	mg/L	0.0003406	0.004126	mg/L	0.0003406	8.26%
QC value within limits for Li 670.784 Recovery = Not calculated								
Mg 279.077 †	-0.9	-0.002000	mg/L	0.0042307	-0.002000	mg/L	0.0042307	211.55%
QC value within limits for Mg 279.077 Recovery = Not calculated								
Mn 260.568†	2.0	0.000127	mg/L	0.0001710	0.000127	mg/L	0.0001710	134.20%
QC value within limits for Mn 260.568 Recovery = Not calculated								
Mo 202.031†	2.1	0.001375	mg/L	0.0001916	0.001375	mg/L	0.0001916	13.93%
QC value within limits for Mo 202.031 Recovery = Not calculated								
Na 589.592†	31.4	0.006025	mg/L	0.0013434	0.006025	mg/L	0.0013434	22.30%
QC value within limits for Na 589.592 Recovery = Not calculated								
Ni 232.003†	4.2	0.000858	mg/L	0.0002916	0.000858	mg/L	0.0002916	33.97%
QC value within limits for Ni 232.003 Recovery = Not calculated								
P 213.617†	1.3	0.003107	mg/L	0.0044691	0.003107	mg/L	0.0044691	143.83%
QC value within limits for P 213.617 Recovery = Not calculated								
Pb 220.353†	1.1	0.001146	mg/L	0.0015486	0.001146	mg/L	0.0015486	135.09%
QC value within limits for Pb 220.353 Recovery = Not calculated								
Sb 206.836†	-4.0	-0.002007	mg/L	0.0001847	-0.002007	mg/L	0.0001847	9.21%
QC value within limits for Sb 206.836 Recovery = Not calculated								
Sc 361.383†	91.6	0.000087	mg/L	0.0000079	0.000087	mg/L	0.0000079	9.12%
QC value within limits for Sc 361.383 Recovery = Not calculated								
Se 196.026†	-0.9	-0.001264	mg/L	0.0031556	-0.001264	mg/L	0.0031556	249.68%
QC value within limits for Se 196.026 Recovery = Not calculated								
Si 251.611†	3.0	0.001832	mg/L	0.0004435	0.001832	mg/L	0.0004435	24.21%
QC value within limits for Si 251.611 Recovery = Not calculated								
SIO2 251.611†	3.0	0.003925	mg/L	0.0009521	0.003925	mg/L	0.0009521	24.25%

QC value within limits for SIO2 251.611 Recovery = Not calculated						
Sn 189.927†	2.6	0.003745 mg/L	0.0023374	0.003745 mg/L	0.0023374	62.41%
QC value within limits for Sn 189.927 Recovery = Not calculated						
Sr 421.552†	45.0	0.000164 mg/L	0.0000024	0.000164 mg/L	0.0000024	1.45%
QC value within limits for Sr 421.552 Recovery = Not calculated						
Ti 336.121†	45.7	0.000112 mg/L	0.0000422	0.000112 mg/L	0.0000422	37.58%
QC value within limits for Ti 336.121 Recovery = Not calculated						
Tl 190.801†	1.6	0.001902 mg/L	0.0031792	0.001902 mg/L	0.0031792	167.19%
QC value within limits for Tl 190.801 Recovery = Not calculated						
U 385.958†	-30.8	-0.007755 mg/L	0.0003574	-0.007755 mg/L	0.0003574	4.61%
V 292.402†	-0.1	-0.000007 mg/L	0.0002084	-0.000007 mg/L	0.0002084	>999.9%
QC value within limits for V 292.402 Recovery = Not calculated						
Zn 206.200†	-1.1	-0.000192 mg/L	0.0001173	-0.000192 mg/L	0.0001173	60.99%
QC value within limits for Zn 206.200 Recovery = Not calculated						

All analyte(s) passed QC.

Sequence No.: 9
Sample ID: CRI
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 9
Date Collected: 4/28/2009 9:06:02 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CRI

Analyte	Mean Corrected Intensity	Calib Conc.	Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	64144.8	104.255	%	0.3126				0.30%
Lu 261.542 A	713790.4	102.422	%	0.1563				0.15%
Ag 328.068†	341.3	0.004933	mg/L	0.0000408	0.004933	mg/L	0.0000408	0.83%
QC value within limits for Ag 328.068 Recovery = 98.65%								
Al 308.215 †	160.5	0.082199	mg/L	0.0008164	0.082199	mg/L	0.0008164	0.99%
QC value within limits for Al 308.215 Recovery = 102.75%								
As 188.979†	22.7	0.025660	mg/L	0.0005078	0.025660	mg/L	0.0005078	1.98%
QC value within limits for As 188.979 Recovery = 102.64% ✓								
B 249.677†	29.8	0.043923	mg/L	0.0016464	0.043923	mg/L	0.0016464	3.75%
QC value within limits for B 249.677 Recovery = 109.81%								
Ba 233.527 A†	260.1	0.002439	mg/L	0.0000301	0.002439	mg/L	0.0000301	1.23%
QC value within limits for Ba 233.527 A Recovery = 121.95%								
Be 313.107 R†	83.2	0.002077	mg/L	0.0000090	0.002077	mg/L	0.0000090	0.43%
QC value within limits for Be 313.107 R Recovery = 103.86%								
Bi 222.821†	48.8	0.065417	mg/L	0.0000153	0.065417	mg/L	0.0000153	0.02%
QC value within limits for Bi 222.821 Recovery = 109.03%								
Ca 315.887 †	149.5	0.041815	mg/L	0.0008743	0.041815	mg/L	0.0008743	2.09%
QC value within limits for Ca 315.887 Recovery = 104.54%								
Cd 226.502†	10.1	0.002090	mg/L	0.0002162	0.002090	mg/L	0.0002162	10.34%
QC value within limits for Cd 226.502 Recovery = 104.51%								
Ce 418.660†	3.8	0.000148	mg/L	0.0002095	0.000148	mg/L	0.0002095	141.24%
Co 228.616†	157.0	0.006263	mg/L	0.0001148	0.006263	mg/L	0.0001148	1.83%
QC value within limits for Co 228.616 Recovery = 104.38%								
Cr 267.716†	54.8	0.006335	mg/L	0.0001153	0.006335	mg/L	0.0001153	1.82%
QC value within limits for Cr 267.716 Recovery = 105.58%								
Cu 324.752†	2559.9	0.009594	mg/L	0.0000728	0.009594	mg/L	0.0000728	0.76%
QC value within limits for Cu 324.752 Recovery = 95.94% ✓								
Fe 273.955 †	73.8	0.067839	mg/L	0.0001421	0.067839	mg/L	0.0001421	0.21%
QC value within limits for Fe 273.955 Recovery = 113.06%								
Ga 417.206†	1370.2	0.019897	mg/L	0.0001187	0.019897	mg/L	0.0001187	0.60%
QC value within limits for Ga 417.206 Recovery = 99.49%								
K 766.490 †	1170.9	0.523951	mg/L	0.0010575	0.523951	mg/L	0.0010575	0.20%
QC value within limits for K 766.490 Recovery = 104.79%								
La 379.478†	623.2	0.004473	mg/L	0.0001494	0.004473	mg/L	0.0001494	3.34%
QC value within limits for La 379.478 Recovery = 89.46%								
Li 670.784†	2341.3	0.024348	mg/L	0.0002305	0.024348	mg/L	0.0002305	0.95%
QC value within limits for Li 670.784 Recovery = 121.74%								
Mg 279.077 †	25.9	0.059602	mg/L	0.0024272	0.059602	mg/L	0.0024272	4.07%
QC value within limits for Mg 279.077 Recovery = 99.34%								
Mn 260.568†	64.6	0.004209	mg/L	0.0000346	0.004209	mg/L	0.0000346	0.82%
QC value within limits for Mn 260.568 Recovery = 105.22%								
Mo 202.031†	13.0	0.008500	mg/L	0.0006601	0.008500	mg/L	0.0006601	7.77%
QC value within limits for Mo 202.031 Recovery = 106.25%								
Na 589.592†	2936.7	0.564142	mg/L	0.0018122	0.564142	mg/L	0.0018122	0.32%
QC value within limits for Na 589.592 Recovery = 112.83%								
Ni 232.003†	49.6	0.010150	mg/L	0.0008054	0.010150	mg/L	0.0008054	7.94%
QC value within limits for Ni 232.003 Recovery = 101.50%								
P 213.617†	20.5	0.049933	mg/L	0.0076421	0.049933	mg/L	0.0076421	15.30%
QC value within limits for P 213.617 Recovery = 99.87%								
Pb 220.353†	8.0	0.008404	mg/L	0.0002453	0.008404	mg/L	0.0002453	2.92%
QC value within limits for Pb 220.353 Recovery = 112.06% ✓								
Sb 206.836†	38.2	0.018796	mg/L	0.0012349	0.018796	mg/L	0.0012349	6.57%
QC value within limits for Sb 206.836 Recovery = 93.98%								
Sc 361.383†	2308.9	0.002183	mg/L	0.0000058	0.002183	mg/L	0.0000058	0.27%
QC value within limits for Sc 361.383 Recovery = 109.13%								
Se 196.026†	28.3	0.037954	mg/L	0.0019909	0.037954	mg/L	0.0019909	5.25%
QC value within limits for Se 196.026 Recovery = 94.89%								
Si 251.611†	141.2	0.086904	mg/L	0.0001041	0.086904	mg/L	0.0001041	0.12%
QC value within limits for Si 251.611 Recovery = 108.63%								
SIO2 251.611†	141.2	0.186043	mg/L	0.0002225	0.186043	mg/L	0.0002225	0.12%

QC value within limits for SIO2 251.611 Recovery = 108.80%						
Sn 189.927†	37.5	0.053279 mg/L	0.0003866	0.053279 mg/L	0.0003866	0.73%
QC value within limits for Sn 189.927 Recovery = 106.56%						
Sr 421.552†	1436.0	0.005231 mg/L	0.0000412	0.005231 mg/L	0.0000412	0.79%
QC value within limits for Sr 421.552 Recovery = 104.62%						
Ti 336.121†	2120.2	0.005434 mg/L	0.0000537	0.005434 mg/L	0.0000537	0.99%
QC value within limits for Ti 336.121 Recovery = 108.68%						
Tl 190.801†	13.1	0.015197 mg/L	0.0007856	0.015197 mg/L	0.0007856	5.17%
QC value within limits for Tl 190.801 Recovery = 101.31%						
U 385.958†	49.4	0.011433 mg/L	0.0015080	0.011433 mg/L	0.0015080	13.19%
V 292.402†	82.8	0.005333 mg/L	0.0000359	0.005333 mg/L	0.0000359	0.67%
QC value within limits for V 292.402 Recovery = 106.67%						
Zn 206.200†	61.0	0.010265 mg/L	0.0000623	0.010265 mg/L	0.0000623	0.61%
QC value within limits for Zn 206.200 Recovery = 102.65%						

All analyte(s) passed QC.

Sequence No.: 10
Sample ID: ICSA
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 7
Date Collected: 4/28/2009 9:11:42 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ICSA

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	61362.8	99.7332	%	0.13620				0.14%
Lu 261.542 A	619117.6	88.8373	%	0.19174				0.22%
Ag 328.068†	-1142.6	-0.000153	mg/L	0.0002384	-0.000153	mg/L	0.0002384	155.87%
Al 308.215 †	932686.6	477.831	mg/L	2.3114	477.831	mg/L	2.3114	0.48%
QC value within limits for Al 308.215 Recovery = 95.57%								
As 188.979†	36.6	0.001319	mg/L	0.0050546	0.001319	mg/L	0.0050546	383.35%
B 249.677†	11.2	0.038241	mg/L	0.0000395	0.038241	mg/L	0.0000395	0.10%
Ba 233.527 A†	-21.9	0.002467	mg/L	0.0001464	0.002467	mg/L	0.0001464	5.93%
Be 313.107 R†	-37.5	-0.000010	mg/L	0.0000548	-0.000010	mg/L	0.0000548	571.97%
Bi 222.821†	456.4	-0.012299	mg/L	0.0256964	-0.012299	mg/L	0.0256964	208.94%
Ca 315.887 †	1622554.4	455.910	mg/L	2.5094	455.910	mg/L	2.5094	0.55%
QC value within limits for Ca 315.887 Recovery = 91.18%								
Cd 226.502†	185.4	0.011201	mg/L	0.0009068	0.011201	mg/L	0.0009068	8.10%
Ce 418.660†	32.7	0.015542	mg/L	0.0001417	0.015542	mg/L	0.0001417	0.91%
Co 228.616†	556.2	-0.002344	mg/L	0.0001709	-0.002344	mg/L	0.0001709	7.29%
Cr 267.716†	83039.8	9.60730	mg/L	0.014302	9.60730	mg/L	0.014302	0.15%
QC value within limits for Cr 267.716 Recovery = 96.07%								
Cu 324.752†	2997545.6	11.2480	mg/L	0.07219	11.2480	mg/L	0.07219	0.64%
QC value within limits for Cu 324.752 Recovery = 112.48%								
Fe 273.955 †	186518.9	171.344	mg/L	0.1166	171.344	mg/L	0.1166	0.07%
QC value within limits for Fe 273.955 Recovery = 85.67%								
Ga 417.206†	4145.2	0.007547	mg/L	0.0003571	0.007547	mg/L	0.0003571	4.73%
K 766.490 †	-13.3	-0.005929	mg/L	0.0045338	-0.005929	mg/L	0.0045338	76.46%
La 379.478†	31030.4	0.094120	mg/L	0.0039483	0.094120	mg/L	0.0039483	4.19%
Li 670.784†	591.1	0.005703	mg/L	0.0003040	0.005703	mg/L	0.0003040	5.33%
Mg 279.077 †	203983.0	469.322	mg/L	0.0670	469.322	mg/L	0.0670	0.01%
QC value within limits for Mg 279.077 Recovery = 93.86%								
Mn 260.568†	133812.3	8.70760	mg/L	0.003798	8.70760	mg/L	0.003798	0.04%
QC value within limits for Mn 260.568 Recovery = 87.08%								
Mo 202.031†	35.6	-0.001084	mg/L	0.0024492	-0.001084	mg/L	0.0024492	225.99%
Na 589.592†	142.2	0.027313	mg/L	0.0003716	0.027313	mg/L	0.0003716	1.36%
Ni 232.003†	49769.2	10.2653	mg/L	0.05198	10.2653	mg/L	0.05198	0.51%
QC value within limits for Ni 232.003 Recovery = 102.65%								
P 213.617†	60.3	0.104288	mg/L	0.0387333	0.104288	mg/L	0.0387333	37.14%
Pb 220.353†	30.9	-0.000033	mg/L	0.0012408	-0.000033	mg/L	0.0012408	>999.9%
Sb 206.836†	127.9	-0.011171	mg/L	0.0022236	-0.011171	mg/L	0.0022236	19.90%
Sc 361.383†	-417.9	0.000064	mg/L	0.0000116	0.000064	mg/L	0.0000116	18.12%
Se 196.026†	2.7	-0.014331	mg/L	0.0021932	-0.014331	mg/L	0.0021932	15.30%
Si 251.611†	202.8	0.044144	mg/L	0.0041524	0.044144	mg/L	0.0041524	9.41%
SIO2 251.611†	202.8	0.059511	mg/L	0.0089112	0.059511	mg/L	0.0089112	14.97%
Sn 189.927†	33.4	-0.013411	mg/L	0.0142887	-0.013411	mg/L	0.0142887	106.55%
Sr 421.552†	943.7	-0.002216	mg/L	0.0000172	-0.002216	mg/L	0.0000172	0.78%
Ti 336.121†	3526036.2	9.59392	mg/L	0.062755	9.59392	mg/L	0.062755	0.65%
QC value within limits for Ti 336.121 Recovery = 95.94%								
Tl 190.801†	-82.5	-0.000718	mg/L	0.0012509	-0.000718	mg/L	0.0012509	174.34%
U 385.958†	13960.0	2.05246	mg/L	0.022185	2.05246	mg/L	0.022185	1.08%
V 292.402†	155058.4	9.85939	mg/L	0.026302	9.85939	mg/L	0.026302	0.27%
QC value within limits for V 292.402 Recovery = 98.59%								
Zn 206.200†	214.9	0.010056	mg/L	0.0001678	0.010056	mg/L	0.0001678	1.67%

All analyte(s) passed QC.

Sequence No.: 11
Sample ID: ICSAB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 8
Date Collected: 4/28/2009 9:18:15 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ICSAB

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	62599.8	101.744	%	1.9179				1.89%
Lu 261.542 A	636698.9	91.3600	%	0.23065				0.25%
Ag 328.068†	38043.9	0.566227	mg/L	0.0020171	0.566227	mg/L	0.0020171	0.36%
QC value within limits for Ag 328.068 Recovery = 113.25%								
Al 308.215 †	998142.9	511.480	mg/L	4.2014	511.480	mg/L	4.2014	0.82%
QC value within limits for Al 308.215 Recovery = 102.30%								
As 188.979†	501.6	0.530172	mg/L	0.0033444	0.530172	mg/L	0.0033444	0.63%
QC value within limits for As 188.979 Recovery = 106.03%								
B 249.677†	9.4	0.035958	mg/L	0.0004890	0.035958	mg/L	0.0004890	1.36%
Ba 233.527 A†	58762.1	0.516203	mg/L	0.0007902	0.516203	mg/L	0.0007902	0.15%
QC value within limits for Ba 233.527 A Recovery = 103.24%								
Be 313.107 R†	18806.9	0.469262	mg/L	0.0007188	0.469262	mg/L	0.0007188	0.15%
QC value within limits for Be 313.107 R Recovery = 93.85%								
Bi 222.821†	315.5	0.011490	mg/L	0.0042938	0.011490	mg/L	0.0042938	37.37%
Ca 315.887 †	1747830.1	491.089	mg/L	5.2266	491.089	mg/L	5.2266	1.06%
QC value within limits for Ca 315.887 Recovery = 98.22%								
Cd 226.502†	2493.8	0.483771	mg/L	0.0008588	0.483771	mg/L	0.0008588	0.18%
QC value within limits for Cd 226.502 Recovery = 96.75%								
Ce 418.660†	90.3	0.012663	mg/L	0.0005284	0.012663	mg/L	0.0005284	4.17%
Co 228.616†	11404.1	0.450340	mg/L	0.0009650	0.450340	mg/L	0.0009650	0.21%
QC value within limits for Co 228.616 Recovery = 90.07%								
Cr 267.716†	4311.8	0.482451	mg/L	0.0006508	0.482451	mg/L	0.0006508	0.13%
QC value within limits for Cr 267.716 Recovery = 96.49%								
Cu 324.752†	158127.0	0.593193	mg/L	0.0049180	0.593193	mg/L	0.0049180	0.83%
QC value within limits for Cu 324.752 Recovery = 118.64%								
Fe 273.955 †	200751.6	184.420	mg/L	0.8229	184.420	mg/L	0.8229	0.45%
QC value within limits for Fe 273.955 Recovery = 92.21%								
Ga 417.206†	3171.3	0.014398	mg/L	0.0005241	0.014398	mg/L	0.0005241	3.64%
K 766.490 †	-11.1	-0.004943	mg/L	0.0014347	-0.004943	mg/L	0.0014347	29.03%
La 379.478†	24767.4	0.084263	mg/L	0.0005742	0.084263	mg/L	0.0005742	0.68%
Li 670.784†	101.4	0.001028	mg/L	0.0001860	0.001028	mg/L	0.0001860	18.10%
Mg 279.077 †	219479.7	504.897	mg/L	6.9229	504.897	mg/L	6.9229	1.37%
QC value within limits for Mg 279.077 Recovery = 100.98%								
Mn 260.568†	7175.5	0.445096	mg/L	0.0052407	0.445096	mg/L	0.0052407	1.18%
QC value within limits for Mn 260.568 Recovery = 89.02%								
Mo 202.031†	33.5	-0.004272	mg/L	0.0001509	-0.004272	mg/L	0.0001509	3.53%
Na 589.592†	149.5	0.028715	mg/L	0.0010018	0.028715	mg/L	0.0010018	3.49%
Ni 232.003†	1484.0	0.519585	mg/L	0.0060700	0.519585	mg/L	0.0060700	1.17%
QC value within limits for Ni 232.003 Recovery = 103.92%								
P 213.617†	-27.4	0.051900	mg/L	0.0107171	0.051900	mg/L	0.0107171	20.65%
Pb 220.353†	484.7	0.481149	mg/L	0.0000797	0.481149	mg/L	0.0000797	0.02%
QC value within limits for Pb 220.353 Recovery = 96.23%								
Sb 206.836†	1023.5	0.495206	mg/L	0.0026253	0.495206	mg/L	0.0026253	0.53%
QC value within limits for Sb 206.836 Recovery = 99.04%								
Sc 361.383†	-361.8	0.000497	mg/L	0.0000004	0.000497	mg/L	0.0000004	0.07%
Se 196.026†	388.8	0.514607	mg/L	0.0185193	0.514607	mg/L	0.0185193	3.60%
QC value within limits for Se 196.026 Recovery = 102.92%								
Si 251.611†	45.1	-0.020839	mg/L	0.0007691	-0.020839	mg/L	0.0007691	3.69%
SIO2 251.611†	45.1	-0.082190	mg/L	0.0021517	-0.082190	mg/L	0.0021517	2.62%
Sn 189.927†	40.9	-0.025305	mg/L	0.0043562	-0.025305	mg/L	0.0043562	17.21%
Sr 421.552†	1038.5	-0.002307	mg/L	0.0000403	-0.002307	mg/L	0.0000403	1.75%
Ti 336.121†	5209.1	0.000375	mg/L	0.0001111	0.000375	mg/L	0.0001111	29.58%
Tl 190.801†	348.2	0.475728	mg/L	0.0100842	0.475728	mg/L	0.0100842	2.12%
QC value within limits for Tl 190.801 Recovery = 95.15%								
U 385.958†	16923.3	2.67561	mg/L	0.016816	2.67561	mg/L	0.016816	0.63%
V 292.402†	8252.2	0.520570	mg/L	0.0008273	0.520570	mg/L	0.0008273	0.16%
QC value within limits for V 292.402 Recovery = 104.11%								
Zn 206.200†	2936.1	0.466123	mg/L	0.0013582	0.466123	mg/L	0.0013582	0.29%
QC value within limits for Zn 206.200 Recovery = 93.22%								

All analyte(s) passed QC.

Sequence No.: 12
Sample ID: CCV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 6
Date Collected: 4/28/2009 9:24:45 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCV

Analyte	Mean Corrected Intensity	Calib Conc.	Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	65138.2	105.869	%	0.0287				0.03%
Lu 261.542 A	728181.4	104.487	%	0.1078				0.10%
Ag 328.068†	139127.6	2.01112	mg/L	0.001366	2.01112	mg/L	0.001366	0.07%
QC value within limits for Ag 328.068 Recovery = 100.56%								
Al 308.215 †	4183.8	2.12075	mg/L	0.000621	2.12075	mg/L	0.000621	0.03%
QC value within limits for Al 308.215 Recovery = 106.04%								
As 188.979†	1935.3	2.05745	mg/L	0.004443	2.05745	mg/L	0.004443	0.22%
QC value within limits for As 188.979 Recovery = 102.87%								
B 249.677†	1375.9	2.02438	mg/L	0.000739	2.02438	mg/L	0.000739	0.04%
QC value within limits for B 249.677 Recovery = 101.22%								
Ba 233.527 A†	230825.1	2.05523	mg/L	0.004358	2.05523	mg/L	0.004358	0.21%
QC value within limits for Ba 233.527 A Recovery = 102.76%								
Be 313.107 R†	78247.8	1.94921	mg/L	0.007784	1.94921	mg/L	0.007784	0.40%
QC value within limits for Be 313.107 R Recovery = 97.46%								
Bi 222.821†	2885.0	3.82095	mg/L	0.027611	3.82095	mg/L	0.027611	0.72%
QC value within limits for Bi 222.821 Recovery = 95.52%								
Ca 315.887 †	7650.9	2.13594	mg/L	0.001841	2.13594	mg/L	0.001841	0.09%
QC value within limits for Ca 315.887 Recovery = 106.80%								
Cd 226.502†	9759.7	2.03292	mg/L	0.008413	2.03292	mg/L	0.008413	0.41%
QC value within limits for Cd 226.502 Recovery = 101.65%								
Ce 418.660†	-355.8	-0.000685	mg/L	0.0002590	-0.000685	mg/L	0.0002590	37.79%
QC value within limits for Ce 418.660 Recovery = Not calculated								
Co 228.616†	51794.7	2.06604	mg/L	0.001714	2.06604	mg/L	0.001714	0.08%
QC value within limits for Co 228.616 Recovery = 103.30%								
Cr 267.716†	17540.2	2.03140	mg/L	0.011457	2.03140	mg/L	0.011457	0.56%
QC value within limits for Cr 267.716 Recovery = 101.57%								
Cu 324.752†	535700.3	2.00829	mg/L	0.009491	2.00829	mg/L	0.009491	0.47%
QC value within limits for Cu 324.752 Recovery = 100.41%								
Fe 273.955 †	2266.8	2.08398	mg/L	0.000061	2.08398	mg/L	0.000061	0.00%
QC value within limits for Fe 273.955 Recovery = 104.20%								
Ga 417.206†	266412.3	3.87009	mg/L	0.018800	3.87009	mg/L	0.018800	0.49%
QC value within limits for Ga 417.206 Recovery = 96.75%								
K 766.490 †	43177.4	19.3202	mg/L	0.16282	19.3202	mg/L	0.16282	0.84%
QC value within limits for K 766.490 Recovery = 96.60%								
La 379.478†	536745.5	3.88929	mg/L	0.007647	3.88929	mg/L	0.007647	0.20%
QC value within limits for La 379.478 Recovery = 97.23%								
Li 670.784†	363390.9	3.77933	mg/L	0.012567	3.77933	mg/L	0.012567	0.33%
QC value within limits for Li 670.784 Recovery = 94.48%								
Mg 279.077 †	914.4	2.13815	mg/L	0.005133	2.13815	mg/L	0.005133	0.24%
QC value within limits for Mg 279.077 Recovery = 106.91%								
Mn 260.568†	31001.2	2.02113	mg/L	0.003251	2.02113	mg/L	0.003251	0.16%
QC value within limits for Mn 260.568 Recovery = 101.06%								
Mo 202.031†	3097.8	2.02505	mg/L	0.004930	2.02505	mg/L	0.004930	0.24%
QC value within limits for Mo 202.031 Recovery = 101.25%								
Na 589.592†	108701.7	20.8818	mg/L	0.09080	20.8818	mg/L	0.09080	0.43%
QC value within limits for Na 589.592 Recovery = 104.41%								
Ni 232.003†	10105.5	2.03799	mg/L	0.005319	2.03799	mg/L	0.005319	0.26%
QC value within limits for Ni 232.003 Recovery = 101.90%								
P 213.617†	3873.3	9.41929	mg/L	0.023256	9.41929	mg/L	0.023256	0.25%
QC value within limits for P 213.617 Recovery = 94.19%								
Pb 220.353†	1866.4	1.96773	mg/L	0.003477	1.96773	mg/L	0.003477	0.18%
QC value within limits for Pb 220.353 Recovery = 98.39%								
Sb 206.836†	4110.8	2.02098	mg/L	0.001227	2.02098	mg/L	0.001227	0.06%
QC value within limits for Sb 206.836 Recovery = 101.05%								
Sc 361.383†	1037856.4	0.981324	mg/L	0.0008663	0.981324	mg/L	0.0008663	0.09%
QC value within limits for Sc 361.383 Recovery = 98.13%								
Se 196.026†	1504.2	2.02601	mg/L	0.002636	2.02601	mg/L	0.002636	0.13%
QC value within limits for Se 196.026 Recovery = 101.30%								
Si 251.611†	15920.6	9.78167	mg/L	0.008845	9.78167	mg/L	0.008845	0.09%
QC value within limits for Si 251.611 Recovery = 97.82%								

SIO2 251.611†	15920.6	20.9380 mg/L	0.01892	20.9380 mg/L	0.01892	0.09%
QC value within limits for SIO2 251.611 Recovery = 97.84%						
Sn 189.927†	2803.2	3.98962 mg/L	0.002512	3.98962 mg/L	0.002512	0.06%
QC value within limits for Sn 189.927 Recovery = 99.74%						
Sr 421.552†	537672.3	1.95867 mg/L	0.011526	1.95867 mg/L	0.011526	0.59%
QC value within limits for Sr 421.552 Recovery = 97.93%						
Ti 336.121†	805135.9	2.04075 mg/L	0.000246	2.04075 mg/L	0.000246	0.01%
QC value within limits for Ti 336.121 Recovery = 102.04%						
Tl 190.801†	1762.6	2.04448 mg/L	0.015155	2.04448 mg/L	0.015155	0.74%
QC value within limits for Tl 190.801 Recovery = 102.22%						
U 385.958†	4211.8	0.871615 mg/L	0.0159275	0.871615 mg/L	0.0159275	1.83%
V 292.402†	32042.7	2.05226 mg/L	0.004954	2.05226 mg/L	0.004954	0.24%
QC value within limits for V 292.402 Recovery = 102.61%						
Zn 206.200†	12105.4	2.03694 mg/L	0.018762	2.03694 mg/L	0.018762	0.92%
QC value within limits for Zn 206.200 Recovery = 101.85%						

All analyte(s) passed QC.

Sequence No.: 13
Sample ID: CCB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 1
Date Collected: 4/28/2009 9:30:44 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCB

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	66269.4	107.708	%	0.3367				0.31%
Lu 261.542 A	731946.5	105.027	%	0.1361				0.13%
Ag 328.068†	5.7	0.000092	mg/L	0.0000342	0.000092	mg/L	0.0000342	36.94%
QC value within limits for Ag 328.068 Recovery = Not calculated								
Al 308.215 †	5.6	0.002781	mg/L	0.0005725	0.002781	mg/L	0.0005725	20.58%
QC value within limits for Al 308.215 Recovery = Not calculated								
As 188.979†	1.8	0.002014	mg/L	0.0002354	0.002014	mg/L	0.0002354	11.69%
QC value within limits for As 188.979 Recovery = Not calculated								
B 249.677†	1.2	0.001804	mg/L	0.0011423	0.001804	mg/L	0.0011423	63.31%
QC value within limits for B 249.677 Recovery = Not calculated								
Ba 233.527 At	36.3	0.000325	mg/L	0.0000239	0.000325	mg/L	0.0000239	7.35%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	3.4	0.000081	mg/L	0.0000219	0.000081	mg/L	0.0000219	26.84%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821†	4.9	0.006580	mg/L	0.0026170	0.006580	mg/L	0.0026170	39.77%
QC value within limits for Bi 222.821 Recovery = Not calculated								
Ca 315.887 †	16.0	0.004549	mg/L	0.0006470	0.004549	mg/L	0.0006470	14.22%
QC value within limits for Ca 315.887 Recovery = Not calculated								
Cd 226.502†	1.3	0.000267	mg/L	0.0002579	0.000267	mg/L	0.0002579	96.59%
QC value within limits for Cd 226.502 Recovery = Not calculated								
Ce 418.660†	11.6	0.000319	mg/L	0.0002735	0.000319	mg/L	0.0002735	85.84%
Co 228.616†	5.2	0.000207	mg/L	0.0001124	0.000207	mg/L	0.0001124	54.32%
QC value within limits for Co 228.616 Recovery = Not calculated								
Cr 267.716†	-1.2	-0.000130	mg/L	0.0001687	-0.000130	mg/L	0.0001687	130.03%
QC value within limits for Cr 267.716 Recovery = Not calculated								
Cu 324.752†	51.4	0.000201	mg/L	0.0001075	0.000201	mg/L	0.0001075	53.36%
QC value within limits for Cu 324.752 Recovery = Not calculated								
Fe 273.955 †	6.0	0.005478	mg/L	0.0000991	0.005478	mg/L	0.0000991	1.81%
QC value within limits for Fe 273.955 Recovery = Not calculated								
Ga 417.206†	8.4	0.000125	mg/L	0.0000433	0.000125	mg/L	0.0000433	34.53%
QC value within limits for Ga 417.206 Recovery = Not calculated								
K 766.490 †	12.4	0.005537	mg/L	0.0028392	0.005537	mg/L	0.0028392	51.28%
QC value within limits for K 766.490 Recovery = Not calculated								
La 379.478†	68.0	0.000482	mg/L	0.0000269	0.000482	mg/L	0.0000269	5.57%
QC value within limits for La 379.478 Recovery = Not calculated								
Li 670.784†	22.6	0.000235	mg/L	0.0001101	0.000235	mg/L	0.0001101	46.78%
QC value within limits for Li 670.784 Recovery = Not calculated								
Mg 279.077 †	-0.4	-0.000769	mg/L	0.0059451	-0.000769	mg/L	0.0059451	773.54%
QC value within limits for Mg 279.077 Recovery = Not calculated								
Mn 260.568†	1.5	0.000095	mg/L	0.0000781	0.000095	mg/L	0.0000781	81.86%
QC value within limits for Mn 260.568 Recovery = Not calculated								
Mo 202.031†	0.9	0.000567	mg/L	0.0006683	0.000567	mg/L	0.0006683	117.91%
QC value within limits for Mo 202.031 Recovery = Not calculated								
Na 589.592†	35.0	0.006716	mg/L	0.0004202	0.006716	mg/L	0.0004202	6.26%
QC value within limits for Na 589.592 Recovery = Not calculated								
Ni 232.003†	6.1	0.001279	mg/L	0.0003438	0.001279	mg/L	0.0003438	26.87%
QC value within limits for Ni 232.003 Recovery = Not calculated								
P 213.617†	0.6	0.001531	mg/L	0.0053843	0.001531	mg/L	0.0053843	351.61%
QC value within limits for P 213.617 Recovery = Not calculated								
Pb 220.353†	-0.0	0.000014	mg/L	0.0008025	0.000014	mg/L	0.0008025	>999.9%
QC value within limits for Pb 220.353 Recovery = Not calculated								
Sb 206.836†	-4.5	-0.002234	mg/L	0.0007032	-0.002234	mg/L	0.0007032	31.48%
QC value within limits for Sb 206.836 Recovery = Not calculated								
Sc 361.383†	74.7	0.000071	mg/L	0.0000041	0.000071	mg/L	0.0000041	5.78%
QC value within limits for Sc 361.383 Recovery = Not calculated								
Se 196.026†	-0.4	-0.000516	mg/L	0.0021193	-0.000516	mg/L	0.0021193	411.03%
QC value within limits for Se 196.026 Recovery = Not calculated								
Si 251.611†	1.0	0.000615	mg/L	0.0002647	0.000615	mg/L	0.0002647	43.02%
QC value within limits for Si 251.611 Recovery = Not calculated								
SIO2 251.611†	1.0	0.001320	mg/L	0.0005628	0.001320	mg/L	0.0005628	42.65%

QC value within limits for SIO2 251.611 Recovery = Not calculated						
Sn 189.927†	1.6	0.002209 mg/L	0.0028111	0.002209 mg/L	0.0028111	127.25%
QC value within limits for Sn 189.927 Recovery = Not calculated						
Sr 421.552†	41.9	0.000153 mg/L	0.0000045	0.000153 mg/L	0.0000045	2.92%
QC value within limits for Sr 421.552 Recovery = Not calculated						
Ti 336.121†	41.0	0.000102 mg/L	0.0000236	0.000102 mg/L	0.0000236	23.14%
QC value within limits for Ti 336.121 Recovery = Not calculated						
Tl 190.801†	1.1	0.001249 mg/L	0.0013721	0.001249 mg/L	0.0013721	109.83%
QC value within limits for Tl 190.801 Recovery = Not calculated						
U 385.958†	-38.0	-0.009582 mg/L	0.0026834	-0.009582 mg/L	0.0026834	28.01%
V 292.402†	2.6	0.000157 mg/L	0.0000254	0.000157 mg/L	0.0000254	16.19%
QC value within limits for V 292.402 Recovery = Not calculated						
Zn 206.200†	-0.7	-0.000127 mg/L	0.0002934	-0.000127 mg/L	0.0002934	231.38%
QC value within limits for Zn 206.200 Recovery = Not calculated						

All analyte(s) passed QC.

Analysis Begun

Start Time: 4/28/2009 10:02:02 AM
Plasma On Time: 4/28/2009 6:35:00 AM
Logged In Analyst: optima1
Technique: ICP Continuous
Spectrometer Model: Optima 4300 DV, S/N 077N0061602Autosampler Model: AS-93plus

Sample Information File: C:\pe\Optima1\Sample Information\START.sif
Batch ID: W917163
Results Data Set: 09118A
Results Library: C:\pe\Optima1\Results\Results.mdb

Method Loaded
Method Name: OPT1
Method Last Saved: 4/28/2009 8:19:07 AM
IEC File: OPT1.iec
MSF File:
Method Description:

Sequence No.: 1
Autosampler Location: 38
Sample ID: W917163-BLK1
Date Collected: 4/28/2009 10:02:02 AM
Analyst:
Data Type: Original
Initial Sample Wt:
Initial Sample Vol:
Dilution:
Sample Prep Vol:

Mean Data: W917163-BLK1

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	64499.3	104.831	%	0.5256				0.50%
Lu 261.542 A	711363.7	102.074	%	0.2760				0.27%
Ag 328.068†	9.8	0.000150	mg/L	0.0001134	0.000150	mg/L	0.0001134	75.44%
QC value within limits for Ag 328.068 Recovery = Not calculated								
Al 308.215 †	-0.8	-0.000509	mg/L	0.0007776	-0.000509	mg/L	0.0007776	152.89%
QC value within limits for Al 308.215 Recovery = Not calculated								
As 188.979†	-4.1	-0.004658	mg/L	0.0000025	-0.004658	mg/L	0.0000025	0.05%
QC value within limits for As 188.979 Recovery = Not calculated								
B 249.677†	-0.2	-0.000301	mg/L	0.0007836	-0.000301	mg/L	0.0007836	260.18%
QC value within limits for B 249.677 Recovery = Not calculated								
Ba 233.527 A†	-45.7	-0.000371	mg/L	0.0000070	-0.000371	mg/L	0.0000070	1.88%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 R†	-2.2	-0.000058	mg/L	0.0000449	-0.000058	mg/L	0.0000449	77.21%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821†	-3.6	-0.004956	mg/L	0.0010150	-0.004956	mg/L	0.0010150	20.48%
QC value within limits for Bi 222.821 Recovery = Not calculated								
Ca 315.887 †	16.6	0.004716	mg/L	0.0003508	0.004716	mg/L	0.0003508	7.44%
QC value within limits for Ca 315.887 Recovery = Not calculated								
Cd 226.502†	-1.8	-0.000375	mg/L	0.0001517	-0.000375	mg/L	0.0001517	40.42%
QC value within limits for Cd 226.502 Recovery = Not calculated								
Ce 418.660†	0.6	0.000017	mg/L	0.0000609	0.000017	mg/L	0.0000609	368.54%
Co 228.616†	-7.2	-0.000287	mg/L	0.0000027	-0.000287	mg/L	0.0000027	0.93%
QC value within limits for Co 228.616 Recovery = Not calculated								
Cr 267.716†	9.8	0.001146	mg/L	0.0000432	0.001146	mg/L	0.0000432	3.77%
QC value within limits for Cr 267.716 Recovery = Not calculated								
Cu 324.752†	-172.4	-0.000638	mg/L	0.0000141	-0.000638	mg/L	0.0000141	2.21%
QC value within limits for Cu 324.752 Recovery = Not calculated								
Fe 273.955 †	7.4	0.006742	mg/L	0.0018641	0.006742	mg/L	0.0018641	27.65%
QC value within limits for Fe 273.955 Recovery = Not calculated								
Ga 417.206†	16.6	0.000252	mg/L	0.0001639	0.000252	mg/L	0.0001639	65.04%
QC value within limits for Ga 417.206 Recovery = Not calculated								
K 766.490 †	17.2	0.007691	mg/L	0.0024708	0.007691	mg/L	0.0024708	32.12%
QC value within limits for K 766.490 Recovery = Not calculated								
La 379.478†	39.5	0.000277	mg/L	0.0001820	0.000277	mg/L	0.0001820	65.66%
QC value within limits for La 379.478 Recovery = Not calculated								
Li 670.784†	23.4	0.000242	mg/L	0.0000030	0.000242	mg/L	0.0000030	1.25%
QC value within limits for Li 670.784 Recovery = Not calculated								
Mg 279.077 †	0.1	0.000309	mg/L	0.0009270	0.000309	mg/L	0.0009270	300.01%
QC value within limits for Mg 279.077 Recovery = Not calculated								
Mn 260.568†	4.2	0.000274	mg/L	0.0000290	0.000274	mg/L	0.0000290	10.61%
QC value within limits for Mn 260.568 Recovery = Not calculated								
Mo 202.031†	1.2	0.000754	mg/L	0.0006051	0.000754	mg/L	0.0006051	80.23%

QC value within limits for Mo 202.031 Recovery = Not calculated							
Na 589.592†	111.3	0.021384 mg/L	0.0015997	0.021384 mg/L	0.0015997	7.48%	
QC value within limits for Na 589.592 Recovery = Not calculated							
Ni 232.003†	-7.1	-0.001488 mg/L	0.0001184	-0.001488 mg/L	0.0001184	7.96%	
QC value within limits for Ni 232.003 Recovery = Not calculated							
P 213.617†	2.9	0.007002 mg/L	0.0010964	0.007002 mg/L	0.0010964	15.66%	
QC value within limits for P 213.617 Recovery = Not calculated							
Pb 220.353†	3.5	0.003732 mg/L	0.0003865	0.003732 mg/L	0.0003865	10.36%	
QC value within limits for Pb 220.353 Recovery = Not calculated							
Sb 206.836†	-1.7	-0.000848 mg/L	0.0006787	-0.000848 mg/L	0.0006787	80.03%	
QC value within limits for Sb 206.836 Recovery = Not calculated							
Sc 361.383†	-21.5	-0.000020 mg/L	0.0000010	-0.000020 mg/L	0.0000010	5.08%	
QC value within limits for Sc 361.383 Recovery = Not calculated							
Se 196.026†	-5.3	-0.007171 mg/L	0.0018883	-0.007171 mg/L	0.0018883	26.33%	
QC value within limits for Se 196.026 Recovery = Not calculated							
Si 251.611†	49.2	0.030355 mg/L	0.0015249	0.030355 mg/L	0.0015249	5.02%	
QC value within limits for Si 251.611 Recovery = Not calculated							
SIO2 251.611†	49.2	0.064979 mg/L	0.0032611	0.064979 mg/L	0.0032611	5.02%	
QC value within limits for SIO2 251.611 Recovery = Not calculated							
Sn 189.927†	10.2	0.014501 mg/L	0.0015636	0.014501 mg/L	0.0015636	10.78%	
QC value within limits for Sn 189.927 Recovery = Not calculated							
Sr 421.552†	-5.4	-0.000020 mg/L	0.0000000	-0.000020 mg/L	0.0000000	0.15%	
QC value within limits for Sr 421.552 Recovery = Not calculated							
Ti 336.121†	-149.9	-0.000404 mg/L	0.0000599	-0.000404 mg/L	0.0000599	14.83%	
QC value within limits for Ti 336.121 Recovery = Not calculated							
Tl 190.801†	-1.1	-0.001260 mg/L	0.0012075	-0.001260 mg/L	0.0012075	95.85%	
QC value within limits for Tl 190.801 Recovery = Not calculated							
U 385.958†	-39.1	-0.009845 mg/L	0.0003739	-0.009845 mg/L	0.0003739	3.80%	
QC value within limits for U 385.958 Recovery = Not calculated							
V 292.402†	-2.4	-0.000154 mg/L	0.0001219	-0.000154 mg/L	0.0001219	79.31%	
QC value within limits for V 292.402 Recovery = Not calculated							
Zn 206.200†	14.4	0.002424 mg/L	0.0001388	0.002424 mg/L	0.0001388	5.73%	
QC value within limits for Zn 206.200 Recovery = Not calculated							
All analyte(s) passed QC.							

Sequence No.: 2
Sample ID: W917163-BS1
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 39
Date Collected: 4/28/2009 10:07:42 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W917163-BS1

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	63696.5	103.526	%	0.9956				0.96%
Lu 261.542 A	695200.1	99.7544	%	0.28185				0.28%
Ag 328.068†	3393.3	0.049917	mg/L	0.0001364	0.049917	mg/L	0.0001364	0.27%
QC value within limits for Ag 328.068 Recovery = 99.83%								
Al 308.215 †	2089.3	1.05738	mg/L	0.001117	1.05738	mg/L	0.001117	0.11%
QC value within limits for Al 308.215 Recovery = 105.74%								
As 188.979†	897.6	0.983723	mg/L	0.0047379	0.983723	mg/L	0.0047379	0.48%
QC value within limits for As 188.979 Recovery = 98.37%								
B 249.677†	664.7	0.979063	mg/L	0.0022764	0.979063	mg/L	0.0022764	0.23%
QC value within limits for B 249.677 Recovery = 97.91%								
Ba 233.527 A†	115909.9	1.02933	mg/L	0.001248	1.02933	mg/L	0.001248	0.12%
QC value within limits for Ba 233.527 A Recovery = 102.93%								
Be 313.107 R†	39404.3	0.981465	mg/L	0.0087244	0.981465	mg/L	0.0087244	0.89%
QC value within limits for Be 313.107 R Recovery = 98.15%								
Bi 222.821†	715.9	0.914751	mg/L	0.0077208	0.914751	mg/L	0.0077208	0.84%
QC value within limits for Bi 222.821 Recovery = 91.48%								
Ca 315.887 †	72935.2	20.4879	mg/L	0.06478	20.4879	mg/L	0.06478	0.32%
QC value within limits for Ca 315.887 Recovery = 102.44%								
Cd 226.502†	4663.0	0.969431	mg/L	0.0042531	0.969431	mg/L	0.0042531	0.44%
QC value within limits for Cd 226.502 Recovery = 96.94%								
Ce 418.660†	-168.1	0.000145	mg/L	0.0001637	0.000145	mg/L	0.0001637	113.29%
Co 228.616†	24999.3	0.996987	mg/L	0.0009834	0.996987	mg/L	0.0009834	0.10%
QC value within limits for Co 228.616 Recovery = 99.70%								
Cr 267.716†	8821.1	1.02157	mg/L	0.001019	1.02157	mg/L	0.001019	0.10%
QC value within limits for Cr 267.716 Recovery = 102.16%								
Cu 324.752†	276025.4	1.03550	mg/L	0.001214	1.03550	mg/L	0.001214	0.12%
QC value within limits for Cu 324.752 Recovery = 103.55%								
Fe 273.955 †	10704.0	9.83289	mg/L	0.018785	9.83289	mg/L	0.018785	0.19%
QC value within limits for Fe 273.955 Recovery = 98.33%								
Ga 417.206†	64573.2	0.936050	mg/L	0.0005443	0.936050	mg/L	0.0005443	0.06%
QC value within limits for Ga 417.206 Recovery = 93.61%								
K 766.490 †	42738.6	19.1239	mg/L	0.20425	19.1239	mg/L	0.20425	1.07%
QC value within limits for K 766.490 Recovery = 95.62%								
La 379.478†	137944.4	0.992386	mg/L	0.0003880	0.992386	mg/L	0.0003880	0.04%
QC value within limits for La 379.478 Recovery = 99.24%								
Li 670.784†	94385.3	0.981601	mg/L	0.0059334	0.981601	mg/L	0.0059334	0.60%
QC value within limits for Li 670.784 Recovery = 98.16%								
Mg 279.077 †	8874.1	20.4326	mg/L	0.07870	20.4326	mg/L	0.07870	0.39%
QC value within limits for Mg 279.077 Recovery = 102.16%								
Mn 260.568†	15198.2	0.989906	mg/L	0.0021386	0.989906	mg/L	0.0021386	0.22%
QC value within limits for Mn 260.568 Recovery = 98.99%								
Mo 202.031†	1524.9	0.995610	mg/L	0.0052713	0.995610	mg/L	0.0052713	0.53%
QC value within limits for Mo 202.031 Recovery = 99.56%								
Na 589.592†	103884.8	19.9564	mg/L	0.00763	19.9564	mg/L	0.00763	0.04%
QC value within limits for Na 589.592 Recovery = 105.03%								
Ni 232.003†	4687.7	0.953331	mg/L	0.0007486	0.953331	mg/L	0.0007486	0.08%
QC value within limits for Ni 232.003 Recovery = 95.33%								
P 213.617†	394.4	0.955452	mg/L	0.0029747	0.955452	mg/L	0.0029747	0.31%
QC value within limits for P 213.617 Recovery = 95.55%								
Pb 220.353†	877.9	0.924846	mg/L	0.0026581	0.924846	mg/L	0.0026581	0.29%
QC value within limits for Pb 220.353 Recovery = 92.48%								
Sb 206.836†	1905.2	0.936275	mg/L	0.0085965	0.936275	mg/L	0.0085965	0.92%
QC value within limits for Sb 206.836 Recovery = 93.63%								
Sc 361.383†	509042.2	0.481369	mg/L	0.0007027	0.481369	mg/L	0.0007027	0.15%
QC value within limits for Sc 361.383 Recovery = 96.27%								
Se 196.026†	660.8	0.887378	mg/L	0.0004576	0.887378	mg/L	0.0004576	0.05%
QC value within limits for Se 196.026 Recovery = 88.74%								
Si 251.611†	2153.5	1.30552	mg/L	0.003327	1.30552	mg/L	0.003327	0.25%
QC value less than the lower limit for Si 251.611 Recovery = 26.11%								
SIO2 251.611†	2153.5	2.79361	mg/L	0.007109	2.79361	mg/L	0.007109	0.25%

QC value less than the lower limit for SIO2 251.611 Recovery = 26.11%

Sn 189.927†	712.2	1.00901 mg/L	0.001923	1.00901 mg/L	0.001923	0.19%
QC value within limits for Sn 189.927 Recovery = 100.90%						
Sr 421.552†	270722.9	0.985966 mg/L	0.0084472	0.985966 mg/L	0.0084472	0.86%
QC value within limits for Sr 421.552 Recovery = 98.60%						
Ti 336.121†	407651.8	1.03521 mg/L	0.001214	1.03521 mg/L	0.001214	0.12%
QC value within limits for Ti 336.121 Recovery = 103.52%						
Tl 190.801†	809.1	0.940333 mg/L	0.0034108	0.940333 mg/L	0.0034108	0.36%
QC value within limits for Tl 190.801 Recovery = 94.03%						
U 385.958†	789.2	0.032792 mg/L	0.0014100	0.032792 mg/L	0.0014100	4.30%
QC value less than the lower limit for U 385.958 Recovery = 3.28%						
V 292.402†	16149.3	1.03359 mg/L	0.001352	1.03359 mg/L	0.001352	0.13%
QC value within limits for V 292.402 Recovery = 103.36%						
Zn 206.200†	5685.3	0.955871 mg/L	0.0032576	0.955871 mg/L	0.0032576	0.34%
QC value within limits for Zn 206.200 Recovery = 95.59%						

QC Failed. Continue with analysis.

Sequence No.: 3
Sample ID: W9D0292-01
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 40
Date Collected: 4/28/2009 10:13:26 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0292-01

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	62598.7	101.742	%	0.0391				0.04%
Lu 261.542 A	668282.4	95.8919	%	0.41233				0.43%
Ag 328.068†	-496.6	0.015550	mg/L	0.0005961	0.015550	mg/L	0.0005961	3.83%
Al 308.215 †	278075.7	142.510	mg/L	0.6966	142.510	mg/L	0.6966	0.49%
As 188.979†	714.9	0.791242	mg/L	0.0012513	0.791242	mg/L	0.0012513	0.16%
B 249.677†	29.2	0.069022	mg/L	0.0006832	0.069022	mg/L	0.0006832	0.99%
Ba 233.527 A†	163432.5	1.44138	mg/L	0.006024	1.44138	mg/L	0.006024	0.42%
Be 313.107 R†	442.8	0.011495	mg/L	0.0000112	0.011495	mg/L	0.0000112	0.10%
Bi 222.821†	438.5	0.057301	mg/L	0.0067657	0.057301	mg/L	0.0067657	11.81%
Ca 315.887 †	717207.6	201.516	mg/L	0.9027	201.516	mg/L	0.9027	0.45%
Cd 226.502†	366.2	0.027014	mg/L	0.0005119	0.027014	mg/L	0.0005119	1.90%
Ce 418.660†	14410.8	0.399105	mg/L	0.0007279	0.399105	mg/L	0.0007279	0.18%
Co 228.616†	2585.4	0.092369	mg/L	0.0001601	0.092369	mg/L	0.0001601	0.17%
Cr 267.716†	1643.0	0.179949	mg/L	0.0001196	0.179949	mg/L	0.0001196	0.07%
Cu 324.752†	1868321.1	7.02419	mg/L	0.037816	7.02419	mg/L	0.037816	0.54%
Fe 273.955 †	288488.4	264.998	mg/L	0.3701	264.998	mg/L	0.3701	0.14%
Ga 417.206†	7730.4	0.043645	mg/L	0.0006200	0.043645	mg/L	0.0006200	1.42%
K 766.490 †	69882.4	31.2713	mg/L	0.26682	31.2713	mg/L	0.26682	0.85%
La 379.478†	57916.9	0.266529	mg/L	0.0058764	0.266529	mg/L	0.0058764	2.20%
Li 670.784†	11101.4	0.114977	mg/L	0.0001504	0.114977	mg/L	0.0001504	0.13%
Mg 279.077 †	60799.5	139.937	mg/L	0.2289	139.937	mg/L	0.2289	0.16%
Mn 260.568†	226118.4	14.7310	mg/L	0.03392	14.7310	mg/L	0.03392	0.23%
Mo 202.031†	67.5	0.033864	mg/L	0.0001477	0.033864	mg/L	0.0001477	0.44%
Na 589.592†	3850.0	0.739594	mg/L	0.0080011	0.739594	mg/L	0.0080011	1.08%
Ni 232.003†	-663.2	0.235392	mg/L	0.0062771	0.235392	mg/L	0.0062771	2.67%
P 213.617†	2690.7	6.58122	mg/L	0.006658	6.58122	mg/L	0.006658	0.10%
Pb 220.353†	1725.0	1.78464	mg/L	0.000964	1.78464	mg/L	0.000964	0.05%
Sb 206.836†	24.5	0.029544	mg/L	0.0033448	0.029544	mg/L	0.0033448	11.32%
Sc 361.383†	37648.3	0.036043	mg/L	0.0002687	0.036043	mg/L	0.0002687	0.75%
Se 196.026†	-22.2	-0.003757	mg/L	0.0055618	-0.003757	mg/L	0.0055618	148.04%
Si 251.611†	13639.4	8.42091	mg/L	0.002283	8.42091	mg/L	0.002283	0.03%
SIO2 251.611†	13639.4	18.0100	mg/L	0.00488	18.0100	mg/L	0.00488	0.03%
Sn 189.927†	48.0	0.031187	mg/L	0.0099970	0.031187	mg/L	0.0099970	32.06%
Sr 421.552†	63988.5	0.230557	mg/L	0.0006354	0.230557	mg/L	0.0006354	0.28%
Ti 336.121†	1094149.2	2.97062	mg/L	0.017865	2.97062	mg/L	0.017865	0.60%
Tl 190.801†	-110.1	0.003934	mg/L	0.0006233	0.003934	mg/L	0.0006233	15.85%
U 385.958†	18992.8	2.50946	mg/L	0.008168	2.50946	mg/L	0.008168	0.33%
V 292.402†	5830.0	0.362844	mg/L	0.0023315	0.362844	mg/L	0.0023315	0.64%
Zn 206.200†	31406.1	5.27371	mg/L	0.021981	5.27371	mg/L	0.021981	0.42%

Plasma has been extinguished

==========

Analysis Begun

Start Time: 4/28/2009 10:24:25 AM Plasma On Time: 4/28/2009 10:22:32 AM
Logged In Analyst: optima1 Technique: ICP Continuous
Spectrometer Model: Optima 4300 DV, S/N 077N0061602Autosampler Model: AS-93plus

Sample Information File: C:\pe\Optima1\Sample Information\START.sif
Batch ID: W917163
Results Data Set: 09118A
Results Library: C:\pe\Optima1\Results\Results.mdb

==========

Sequence No.: 4 Autosampler Location: 41
Sample ID: W917163-MS1 Date Collected: 4/28/2009 10:24:25 AM
Analyst: DT Data Type: Original
Initial Sample Wt: Initial Sample Vol:
Dilution: Sample Prep Vol:

Mean Data: W917163-MS1

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	64260.6	104.443	%	0.8725				0.84%
Lu 261.542 A	658271.7	94.4555	%	0.17859				0.19%
Ag 328.068†	3027.1	0.068056	mg/L	0.0002242	0.068056	mg/L	0.0002242	0.33%
Al 308.215 †	445906.5	228.496	mg/L	0.2540	228.496	mg/L	0.2540	0.11%
As 188.979†	1593.5	1.75085	mg/L	0.003170	1.75085	mg/L	0.003170	0.18%
B 249.677†	669.9	1.01329	mg/L	0.011766	1.01329	mg/L	0.011766	1.16%
Ba 233.527 A†	279010.0	2.46753	mg/L	0.000003	2.46753	mg/L	0.000003	0.00%
Be 313.107 R†	39025.0	0.972401	mg/L	0.0010360	0.972401	mg/L	0.0010360	0.11%
Bi 222.821†	1254.6	1.09067	mg/L	0.011711	1.09067	mg/L	0.011711	1.07%
Ca 315.887 †	761606.7	213.984	mg/L	0.9922	213.984	mg/L	0.9922	0.46%
Cd 226.502†	4832.7	0.954262	mg/L	0.0065216	0.954262	mg/L	0.0065216	0.68%
Ce 418.660†	15978.0	0.446878	mg/L	0.0015441	0.446878	mg/L	0.0015441	0.35%
Co 228.616†	26021.9	1.02230	mg/L	0.007769	1.02230	mg/L	0.007769	0.76%
Cr 267.716†	10462.1	1.20076	mg/L	0.009241	1.20076	mg/L	0.009241	0.77%
Cu 324.752†	2100372.6	7.89350	mg/L	0.024719	7.89350	mg/L	0.024719	0.31%
Fe 273.955 †	306615.5	281.650	mg/L	1.3219	281.650	mg/L	1.3219	0.47%
Ga 417.206†	80733.0	1.09346	mg/L	0.000176	1.09346	mg/L	0.000176	0.02%
K 766.490 †	151078.6	67.6038	mg/L	0.03871	67.6038	mg/L	0.03871	0.06%
La 379.478†	204221.6	1.31512	mg/L	0.001613	1.31512	mg/L	0.001613	0.12%
Li 670.784†	114201.6	1.18728	mg/L	0.000370	1.18728	mg/L	0.000370	0.03%
Mg 279.077 †	72525.2	166.927	mg/L	0.3612	166.927	mg/L	0.3612	0.22%
Mn 260.568†	234814.2	15.2963	mg/L	0.05344	15.2963	mg/L	0.05344	0.35%
Mo 202.031†	1495.8	0.967358	mg/L	0.0062449	0.967358	mg/L	0.0062449	0.65%
Na 589.592†	108625.6	20.8672	mg/L	0.13749	20.8672	mg/L	0.13749	0.66%
Ni 232.003†	4298.0	1.25349	mg/L	0.008303	1.25349	mg/L	0.008303	0.66%
P 213.617†	3025.8	7.41071	mg/L	0.015288	7.41071	mg/L	0.015288	0.21%
Pb 220.353†	2529.9	2.63128	mg/L	0.008680	2.63128	mg/L	0.008680	0.33%
Sb 206.836†	942.2	0.476461	mg/L	0.0013023	0.476461	mg/L	0.0013023	0.27%
Sc 361.383†	554800.4	0.525102	mg/L	0.0016704	0.525102	mg/L	0.0016704	0.32%
Se 196.026†	646.0	0.893568	mg/L	0.0085286	0.893568	mg/L	0.0085286	0.95%
Si 251.611†	22775.1	14.0316	mg/L	0.18667	14.0316	mg/L	0.18667	1.33%
SIO2 251.611†	22775.1	30.0162	mg/L	0.39944	30.0162	mg/L	0.39944	1.33%
Sn 189.927†	724.5	1.00490	mg/L	0.003722	1.00490	mg/L	0.003722	0.37%
Sr 421.552†	332847.9	1.20983	mg/L	0.002934	1.20983	mg/L	0.002934	0.24%
Ti 336.121†	2337594.1	6.28165	mg/L	0.011225	6.28165	mg/L	0.011225	0.18%
Tl 190.801†	638.8	0.878269	mg/L	0.0051798	0.878269	mg/L	0.0051798	0.59%
U 385.958†	21458.9	2.90217	mg/L	0.048727	2.90217	mg/L	0.048727	1.68%
V 292.402†	22725.9	1.44236	mg/L	0.009534	1.44236	mg/L	0.009534	0.66%
Zn 206.200†	35939.1	6.03161	mg/L	0.069015	6.03161	mg/L	0.069015	1.14%

Matrix Recovery Check: W917163-MS1

Analyte	Expected Conc.	Measured Conc.	Std. Dev.	Units	Recovery (%)
Al 308.215	143.510	228.496	0.254	mg/L	8598.5
B 249.677	1.06902	1.01329	0.012	mg/L	94.4
Be 313.107 R	1.01149	0.972401	0.001	mg/L	96.1

Ca 315.887	221.516	213.984	0.992	mg/L	62.3
Fe 273.955	274.998	281.650	1.322	mg/L	166.5
K 766.490	51.2713	67.6038	0.039	mg/L	181.7
Li 670.784	1.11498	1.18728	0.000	mg/L	107.2
Mg 279.077	159.937	166.927	0.361	mg/L	135.0
Mn 260.568	15.7310	15.2963	0.053	mg/L	56.5
Na 589.592	19.7396	20.8672	0.137	mg/L	105.9
Si 251.611	13.4209	14.0316	0.187	mg/L	112.2
SIO2 251.611	28.7100	30.0162	0.399	mg/L	112.2
Sr 421.552	1.23056	1.20983	0.003	mg/L	97.9
Ag 328.068	0.065550	0.068056	0.000	mg/L	105.0
As 188.979	1.79124	1.75085	0.003	mg/L	96.0
Ba 233.527 A	2.44138	2.46753	0.000	mg/L	102.6
Bi 222.821	1.05730	1.09067	0.012	mg/L	103.3
Cd 226.502	1.02701	0.954262	0.007	mg/L	92.7
Co 228.616	1.09237	1.02230	0.008	mg/L	93.0
Cr 267.716	1.17995	1.20076	0.009	mg/L	102.1
Cu 324.752	8.02419	7.89350	0.025	mg/L	86.9
Ga 417.206	1.04364	1.09346	0.000	mg/L	105.0
La 379.478	1.26653	1.31512	0.002	mg/L	104.9
Mo 202.031	1.03386	0.967358	0.006	mg/L	93.3
Ni 232.003	1.23539	1.25349	0.008	mg/L	101.8
P 213.617	7.58122	7.41071	0.015	mg/L	82.9
Pb 220.353	2.78464	2.63128	0.009	mg/L	84.7
Sb 206.836	1.02954	0.476461	0.001	mg/L	44.7
Sc 361.383	0.536043	0.525102	0.002	mg/L	97.8
Se 196.026	0.996243	0.893568	0.009	mg/L	89.7
Sn 189.927	1.03119	1.00490	0.004	mg/L	97.4
Ti 336.121	3.97062	6.28165	0.011	mg/L	331.1
Tl 190.801	1.00393	0.878269	0.005	mg/L	87.4
U 385.958	3.50946	2.90217	0.049	mg/L	39.3
V 292.402	1.36284	1.44236	0.010	mg/L	108.0
Zn 206.200	6.27371	6.03161	0.069	mg/L	75.8

Sequence No.: 5
Sample ID: W917163-MSD1
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 42
Date Collected: 4/28/2009 10:31:12 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W917163-MSD1

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Calib Std.Dev.	Sample Conc.	Sample Units	Sample Std.Dev.	RSD
Lu 261.542 R	64327.1	104.551	%	0.3548				0.34%
Lu 261.542 A	655108.9	94.0017	%	0.06821				0.07%
Ag 328.068†	2950.6	0.066510	mg/L	0.0001599	0.066510	mg/L	0.0001599	0.24%
Al 308.215 †	441188.9	226.078	mg/L	1.7081	226.078	mg/L	1.7081	0.76%
As 188.979†	1599.3	1.75806	mg/L	0.008545	1.75806	mg/L	0.008545	0.49%
B 249.677†	669.7	1.01249	mg/L	0.005900	1.01249	mg/L	0.005900	0.58%
Ba 233.527 A†	275804.1	2.43927	mg/L	0.005612	2.43927	mg/L	0.005612	0.23%
Be 313.107 R†	38972.8	0.971108	mg/L	0.0073839	0.971108	mg/L	0.0073839	0.76%
Bi 222.821†	1221.7	1.05495	mg/L	0.005870	1.05495	mg/L	0.005870	0.56%
Ca 315.887 †	755483.6	212.263	mg/L	1.2671	212.263	mg/L	1.2671	0.60%
Cd 226.502†	4767.7	0.941634	mg/L	0.0040639	0.941634	mg/L	0.0040639	0.43%
Ce 418.660†	16078.2	0.449584	mg/L	0.0009442	0.449584	mg/L	0.0009442	0.21%
Co 228.616†	26087.4	1.02504	mg/L	0.002086	1.02504	mg/L	0.002086	0.20%
Cr 267.716†	10480.0	1.20291	mg/L	0.006980	1.20291	mg/L	0.006980	0.58%
Cu 324.752†	2049541.3	7.70240	mg/L	0.021809	7.70240	mg/L	0.021809	0.28%
Fe 273.955 †	301305.5	276.773	mg/L	1.4465	276.773	mg/L	1.4465	0.52%
Ga 417.206†	82513.5	1.12022	mg/L	0.004365	1.12022	mg/L	0.004365	0.39%
K 766.490 †	149697.9	66.9860	mg/L	0.81372	66.9860	mg/L	0.81372	1.21%
La 379.478†	202340.5	1.30430	mg/L	0.000797	1.30430	mg/L	0.000797	0.06%
Li 670.784†	114220.1	1.18748	mg/L	0.008147	1.18748	mg/L	0.008147	0.69%
Mg 279.077 †	72353.6	166.532	mg/L	1.2813	166.532	mg/L	1.2813	0.77%
Mn 260.568†	232448.1	15.1423	mg/L	0.09649	15.1423	mg/L	0.09649	0.64%
Mo 202.031†	1506.2	0.974220	mg/L	0.0014061	0.974220	mg/L	0.0014061	0.14%
Na 589.592†	108501.6	20.8433	mg/L	0.02280	20.8433	mg/L	0.02280	0.11%
Ni 232.003†	4316.0	1.25071	mg/L	0.005780	1.25071	mg/L	0.005780	0.46%
P 213.617†	2985.6	7.31375	mg/L	0.034511	7.31375	mg/L	0.034511	0.47%
Pb 220.353†	2520.2	2.62151	mg/L	0.011219	2.62151	mg/L	0.011219	0.43%
Sb 206.836†	953.0	0.481507	mg/L	0.0000522	0.481507	mg/L	0.0000522	0.01%
Sc 361.383†	553557.7	0.523905	mg/L	0.0011399	0.523905	mg/L	0.0011399	0.22%
Se 196.026†	641.6	0.886808	mg/L	0.0089736	0.886808	mg/L	0.0089736	1.01%
Si 251.611†	25989.2	16.0165	mg/L	0.11715	16.0165	mg/L	0.11715	0.73%
SIO2 251.611†	25989.2	34.2638	mg/L	0.25061	34.2638	mg/L	0.25061	0.73%
Sn 189.927†	723.4	1.00342	mg/L	0.003280	1.00342	mg/L	0.003280	0.33%
Sr 421.552†	332499.8	1.20858	mg/L	0.008119	1.20858	mg/L	0.008119	0.67%
Ti 336.121†	2330346.0	6.26211	mg/L	0.004539	6.26211	mg/L	0.004539	0.07%
Tl 190.801†	642.8	0.881329	mg/L	0.0038416	0.881329	mg/L	0.0038416	0.44%
U 385.958†	21368.6	2.92101	mg/L	0.008371	2.92101	mg/L	0.008371	0.29%
V 292.402†	22826.8	1.44904	mg/L	0.004524	1.44904	mg/L	0.004524	0.31%
Zn 206.200†	35723.0	5.99566	mg/L	0.032720	5.99566	mg/L	0.032720	0.55%

Sequence No.: 6
Sample ID: W9D0292-02
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 43
Date Collected: 4/28/2009 10:37:34 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0292-02

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	65466.7	106.403	%	0.2464				0.23%
Lu 261.542 A	681477.7	97.7853	%	0.16469				0.17%
Ag 328.068†	428.5	0.024507	mg/L	0.0001524	0.024507	mg/L	0.0001524	0.62%
Al 308.215 †	303943.4	155.763	mg/L	0.1124	155.763	mg/L	0.1124	0.07%
As 188.979†	873.6	0.974108	mg/L	0.0038697	0.974108	mg/L	0.0038697	0.40%
B 249.677†	21.3	0.053115	mg/L	0.0001112	0.053115	mg/L	0.0001112	0.21%
Ba 233.527 A†	217332.6	1.91953	mg/L	0.000382	1.91953	mg/L	0.000382	0.02%
Be 313.107 R†	435.1	0.011208	mg/L	0.0000259	0.011208	mg/L	0.0000259	0.23%
Bi 222.821†	482.0	0.188495	mg/L	0.0238801	0.188495	mg/L	0.0238801	12.67%
Ca 315.887 †	443475.0	124.604	mg/L	0.2363	124.604	mg/L	0.2363	0.19%
Cd 226.502†	401.8	0.041592	mg/L	0.0003055	0.041592	mg/L	0.0003055	0.73%
Ce 418.660†	16053.4	0.443038	mg/L	0.0036919	0.443038	mg/L	0.0036919	0.83%
Co 228.616†	2395.7	0.084832	mg/L	0.0001769	0.084832	mg/L	0.0001769	0.21%
Cr 267.716†	1651.8	0.183014	mg/L	0.0000279	0.183014	mg/L	0.0000279	0.02%
Cu 324.752†	3114702.6	11.7004	mg/L	0.05859	11.7004	mg/L	0.05859	0.50%
Fe 273.955 †	248286.7	228.069	mg/L	0.0037	228.069	mg/L	0.0037	0.00%
Ga 417.206†	7636.1	0.047555	mg/L	0.0006988	0.047555	mg/L	0.0006988	1.47%
K 766.490 †	64913.9	29.0483	mg/L	0.18884	29.0483	mg/L	0.18884	0.65%
La 379.478†	56636.4	0.276608	mg/L	0.0013621	0.276608	mg/L	0.0013621	0.49%
Li 670.784†	13441.2	0.139033	mg/L	0.0003878	0.139033	mg/L	0.0003878	0.28%
Mg 279.077 †	39253.9	90.4174	mg/L	0.08823	90.4174	mg/L	0.08823	0.10%
Mn 260.568†	320208.0	20.8707	mg/L	0.00101	20.8707	mg/L	0.00101	0.00%
Mo 202.031†	61.0	0.034087	mg/L	0.0016307	0.034087	mg/L	0.0016307	4.78%
Na 589.592†	3420.2	0.657024	mg/L	0.0023271	0.657024	mg/L	0.0023271	0.35%
Ni 232.003†	-569.0	0.228710	mg/L	0.0033331	0.228710	mg/L	0.0033331	1.46%
P 213.617†	1716.6	4.10671	mg/L	0.010951	4.10671	mg/L	0.010951	0.27%
Pb 220.353†	2606.8	2.71163	mg/L	0.012187	2.71163	mg/L	0.012187	0.45%
Sb 206.836†	40.4	0.033317	mg/L	0.0010618	0.033317	mg/L	0.0010618	3.19%
Sc 361.383†	33567.9	0.031732	mg/L	0.0000965	0.031732	mg/L	0.0000965	0.30%
Se 196.026†	-16.2	-0.003838	mg/L	0.0073406	-0.003838	mg/L	0.0073406	191.27%
Si 251.611†	14297.2	8.82972	mg/L	0.012857	8.82972	mg/L	0.012857	0.15%
SIO2 251.611†	14297.2	18.8886	mg/L	0.02752	18.8886	mg/L	0.02752	0.15%
Sn 189.927†	51.1	0.058985	mg/L	0.0009483	0.058985	mg/L	0.0009483	1.61%
Sr 421.552†	69883.9	0.252981	mg/L	0.0022469	0.252981	mg/L	0.0022469	0.89%
Ti 336.121†	1091881.6	2.96668	mg/L	0.010139	2.96668	mg/L	0.010139	0.34%
Tl 190.801†	-145.7	-0.000610	mg/L	0.0030732	-0.000610	mg/L	0.0030732	503.94%
U 385.958†	16498.6	2.19840	mg/L	0.017263	2.19840	mg/L	0.017263	0.79%
V 292.402†	5672.8	0.354359	mg/L	0.0015695	0.354359	mg/L	0.0015695	0.44%
Zn 206.200†	34188.3	5.74108	mg/L	0.007219	5.74108	mg/L	0.007219	0.13%

Sequence No.: 7
Sample ID: W9D0292-03
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 44
Date Collected: 4/28/2009 10:44:16 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0292-03

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	61795.4	100.436	%	0.4173				0.42%
Lu 261.542 A	624268.5	89.5764	%	0.14297				0.16%
Ag 328.068†	1382.5	0.041849	mg/L	0.0004278	0.041849	mg/L	0.0004278	1.02%
Al 308.215 †	343827.2	176.178	mg/L	0.2206	176.178	mg/L	0.2206	0.13%
As 188.979†	1425.4	1.58066	mg/L	0.000287	1.58066	mg/L	0.000287	0.02%
B 249.677†	25.7	0.072867	mg/L	0.0004243	0.072867	mg/L	0.0004243	0.58%
Ba 233.527 A†	231546.3	2.04496	mg/L	0.003153	2.04496	mg/L	0.003153	0.15%
Be 313.107 R†	321.7	0.008060	mg/L	0.0000242	0.008060	mg/L	0.0000242	0.30%
Bi 222.821†	715.4	0.385452	mg/L	0.0115662	0.385452	mg/L	0.0115662	3.00%
Ca 315.887 †	3326549.9	934.673	mg/L	0.7886	934.673	mg/L	0.7886	0.08%
Cd 226.502†	446.7	0.044139	mg/L	0.0002633	0.044139	mg/L	0.0002633	0.60%
Ce 418.660†	16007.1	0.456428	mg/L	0.0008508	0.456428	mg/L	0.0008508	0.19%
Co 228.616†	4185.3	0.144238	mg/L	0.0002421	0.144238	mg/L	0.0002421	0.17%
Cr 267.716†	2431.9	0.265716	mg/L	0.0017466	0.265716	mg/L	0.0017466	0.66%
Cu 324.752†	8403521.5	31.5485	mg/L	0.18275	31.5485	mg/L	0.18275	0.58%
Fe 273.955 †	273328.2	251.075	mg/L	0.5931	251.075	mg/L	0.5931	0.24%
Ga 417.206†	9271.6	0.061531	mg/L	0.0000712	0.061531	mg/L	0.0000712	0.12%
K 766.490 †	50775.8	22.7220	mg/L	0.14988	22.7220	mg/L	0.14988	0.66%
La 379.478†	62959.0	0.334263	mg/L	0.0005195	0.334263	mg/L	0.0005195	0.16%
Li 670.784†	28529.2	0.296228	mg/L	0.0008912	0.296228	mg/L	0.0008912	0.30%
Mg 279.077 †	74101.2	170.553	mg/L	0.0149	170.553	mg/L	0.0149	0.01%
Mn 260.568†	239976.8	15.6346	mg/L	0.02168	15.6346	mg/L	0.02168	0.14%
Mo 202.031†	57.5	-0.017126	mg/L	0.0005239	-0.017126	mg/L	0.0005239	3.06%
Na 589.592†	4240.8	0.814668	mg/L	0.0004240	0.814668	mg/L	0.0004240	0.05%
Ni 232.003†	1129.3	0.594983	mg/L	0.0016636	0.594983	mg/L	0.0016636	0.28%
P 213.617†	4171.6	9.78282	mg/L	0.042168	9.78282	mg/L	0.042168	0.43%
Pb 220.353†	2290.6	2.36055	mg/L	0.001677	2.36055	mg/L	0.001677	0.07%
Sb 206.836†	48.5	0.038918	mg/L	0.0025165	0.038918	mg/L	0.0025165	6.47%
Sc 361.383†	46909.7	0.044649	mg/L	0.0000466	0.044649	mg/L	0.0000466	0.10%
Se 196.026†	-17.4	-0.012044	mg/L	0.0003824	-0.012044	mg/L	0.0003824	3.17%
Si 251.611†	15652.3	9.63199	mg/L	0.023050	9.63199	mg/L	0.023050	0.24%
SIO2 251.611†	15652.3	20.5996	mg/L	0.04931	20.5996	mg/L	0.04931	0.24%
Sn 189.927†	98.1	-0.089781	mg/L	0.0070350	-0.089781	mg/L	0.0070350	7.84%
Sr 421.552†	162784.2	0.581364	mg/L	0.0010553	0.581364	mg/L	0.0010553	0.18%
Ti 336.121†	3550755.5	9.65553	mg/L	0.063699	9.65553	mg/L	0.063699	0.66%
Tl 190.801†	-124.3	-0.016811	mg/L	0.0017073	-0.016811	mg/L	0.0017073	10.16%
U 385.958†	20198.4	2.91101	mg/L	0.006406	2.91101	mg/L	0.006406	0.22%
V 292.402†	8180.7	0.509883	mg/L	0.0004998	0.509883	mg/L	0.0004998	0.10%
Zn 206.200†	23911.0	4.00926	mg/L	0.027242	4.00926	mg/L	0.027242	0.68%

Sequence No.: 8
Sample ID: W9D0292-04
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 45
Date Collected: 4/28/2009 10:50:31 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0292-04

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Calib Std.Dev.	Sample Conc.	Sample Units	Sample Std.Dev.	RSD
Lu 261.542 R	61788.2	100.425	%	0.4514				0.45%
Lu 261.542 A	634738.7	91.0787	%	0.03686				0.04%
Ag 328.068†	2173.6	0.055687	mg/L	0.0000741	0.055687	mg/L	0.0000741	0.13%
Al 308.215 †	359060.9	183.990	mg/L	0.9110	183.990	mg/L	0.9110	0.50%
As 188.979†	2007.3	2.24831	mg/L	0.009862	2.24831	mg/L	0.009862	0.44%
B 249.677†	30.1	0.078877	mg/L	0.0018023	0.078877	mg/L	0.0018023	2.28%
Ba 233.527 A†	213841.9	1.88761	mg/L	0.006165	1.88761	mg/L	0.006165	0.33%
Be 313.107 R†	360.3	0.009049	mg/L	0.0000103	0.009049	mg/L	0.0000103	0.11%
Bi 222.821†	820.9	0.481607	mg/L	0.0049149	0.481607	mg/L	0.0049149	1.02%
Ca 315.887 †	2682273.8	753.648	mg/L	2.6884	753.648	mg/L	2.6884	0.36%
Cd 226.502†	507.9	0.053372	mg/L	0.0008951	0.053372	mg/L	0.0008951	1.68%
Ce 418.660†	16356.4	0.464467	mg/L	0.0026124	0.464467	mg/L	0.0026124	0.56%
Co 228.616†	4338.7	0.149512	mg/L	0.0005284	0.149512	mg/L	0.0005284	0.35%
Cr 267.716†	2614.7	0.286565	mg/L	0.0022853	0.286565	mg/L	0.0022853	0.80%
Cu 324.752†	12164307.8	45.6644	mg/L	0.14320	45.6644	mg/L	0.14320	0.31%
Fe 273.955 †	303051.7	278.379	mg/L	0.8853	278.379	mg/L	0.8853	0.32%
Ga 417.206†	9861.7	0.061092	mg/L	0.0004310	0.061092	mg/L	0.0004310	0.71%
K 766.490 †	44470.3	19.9006	mg/L	0.14776	19.9006	mg/L	0.14776	0.74%
La 379.478†	66419.9	0.337074	mg/L	0.0053347	0.337074	mg/L	0.0053347	1.58%
Li 670.784†	26527.9	0.275422	mg/L	0.0009515	0.275422	mg/L	0.0009515	0.35%
Mg 279.077 †	98214.4	226.022	mg/L	0.4909	226.022	mg/L	0.4909	0.22%
Mn 260.568†	238582.0	15.5408	mg/L	0.04563	15.5408	mg/L	0.04563	0.29%
Mo 202.031†	58.9	-0.005087	mg/L	0.0012006	-0.005087	mg/L	0.0012006	23.60%
Na 589.592†	4736.2	0.909824	mg/L	0.0002772	0.909824	mg/L	0.0002772	0.03%
Ni 232.003†	1034.2	0.615913	mg/L	0.0080270	0.615913	mg/L	0.0080270	1.30%
P 213.617†	4012.7	9.15509	mg/L	0.007267	9.15509	mg/L	0.007267	0.08%
Pb 220.353†	2849.9	2.93459	mg/L	0.005451	2.93459	mg/L	0.005451	0.19%
Sb 206.836†	60.1	0.046522	mg/L	0.0028855	0.046522	mg/L	0.0028855	6.20%
Sc 361.383†	47546.7	0.045386	mg/L	0.0001499	0.045386	mg/L	0.0001499	0.33%
Se 196.026†	-18.8	-0.008936	mg/L	0.0048623	-0.008936	mg/L	0.0048623	54.42%
Si 251.611†	14551.0	8.94529	mg/L	0.031761	8.94529	mg/L	0.031761	0.36%
SIO2 251.611†	14551.0	19.1259	mg/L	0.06801	19.1259	mg/L	0.06801	0.36%
Sn 189.927†	100.0	-0.034692	mg/L	0.0006737	-0.034692	mg/L	0.0006737	1.94%
Sr 421.552†	129087.4	0.460853	mg/L	0.0000156	0.460853	mg/L	0.0000156	0.00%
Ti 336.121†	3638574.9	9.89516	mg/L	0.010962	9.89516	mg/L	0.010962	0.11%
Tl 190.801†	-124.8	-0.008277	mg/L	0.0001653	-0.008277	mg/L	0.0001653	2.00%
U 385.958†	21771.2	3.07731	mg/L	0.025475	3.07731	mg/L	0.025475	0.83%
V 292.402†	9069.3	0.565331	mg/L	0.0012800	0.565331	mg/L	0.0012800	0.23%
Zn 206.200†	31981.2	5.36848	mg/L	0.001030	5.36848	mg/L	0.001030	0.02%

Sequence No.: 9
Sample ID: W9D0292-05
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 46
Date Collected: 4/28/2009 10:56:37 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0292-05

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	64858.9	105.415	%	0.4816				0.46%
Lu 261.542 A	671334.7	96.3299	%	0.09136				0.09%
Ag 328.068†	1630.1	0.042042	mg/L	0.0000920	0.042042	mg/L	0.0000920	0.22%
Al 308.215 †	277475.7	142.193	mg/L	0.0719	142.193	mg/L	0.0719	0.05%
As 188.979†	1875.1	2.11012	mg/L	0.002998	2.11012	mg/L	0.002998	0.14%
B 249.677†	22.9	0.055767	mg/L	0.0014331	0.055767	mg/L	0.0014331	2.57%
Ba 233.527 A†	146981.0	1.29711	mg/L	0.002434	1.29711	mg/L	0.002434	0.19%
Be 313.107 R†	323.2	0.008379	mg/L	0.0000109	0.008379	mg/L	0.0000109	0.13%
Bi 222.821†	584.8	0.348826	mg/L	0.0029705	0.348826	mg/L	0.0029705	0.85%
Ca 315.887 †	1212669.0	340.728	mg/L	0.3081	340.728	mg/L	0.3081	0.09%
Cd 226.502†	395.2	0.045188	mg/L	0.0003492	0.045188	mg/L	0.0003492	0.77%
Ce 418.660†	12669.7	0.354192	mg/L	0.0009971	0.354192	mg/L	0.0009971	0.28%
Co 228.616†	2204.2	0.078340	mg/L	0.0001110	0.078340	mg/L	0.0001110	0.14%
Cr 267.716†	1778.8	0.197752	mg/L	0.0004741	0.197752	mg/L	0.0004741	0.24%
Cu 324.752†	8553365.0	32.1117	mg/L	0.17963	32.1117	mg/L	0.17963	0.56%
Fe 273.955 †	220509.6	202.553	mg/L	0.5174	202.553	mg/L	0.5174	0.26%
Ga 417.206†	6919.9	0.047533	mg/L	0.0004101	0.047533	mg/L	0.0004101	0.86%
K 766.490 †	69160.3	30.9481	mg/L	0.03561	30.9481	mg/L	0.03561	0.12%
La 379.478†	48037.4	0.236696	mg/L	0.0032333	0.236696	mg/L	0.0032333	1.37%
Li 670.784†	12240.6	0.127154	mg/L	0.0006169	0.127154	mg/L	0.0006169	0.49%
Mg 279.077 †	25345.8	58.3346	mg/L	0.15997	58.3346	mg/L	0.15997	0.27%
Mn 260.568†	116781.9	7.60529	mg/L	0.015056	7.60529	mg/L	0.015056	0.20%
Mo 202.031†	40.0	0.007069	mg/L	0.0002922	0.007069	mg/L	0.0002922	4.13%
Na 589.592†	3575.5	0.686854	mg/L	0.0035382	0.686854	mg/L	0.0035382	0.52%
Ni 232.003†	-471.8	0.186734	mg/L	0.0030195	0.186734	mg/L	0.0030195	1.62%
P 213.617†	2776.3	6.31457	mg/L	0.003114	6.31457	mg/L	0.003114	0.05%
Pb 220.353†	2190.2	2.26010	mg/L	0.005917	2.26010	mg/L	0.005917	0.26%
Sb 206.836†	57.9	0.040129	mg/L	0.0010959	0.040129	mg/L	0.0010959	2.73%
Sc 361.383†	30072.8	0.028890	mg/L	0.0000273	0.028890	mg/L	0.0000273	0.09%
Se 196.026†	-13.0	0.004362	mg/L	0.0126828	0.004362	mg/L	0.0126828	290.76%
Si 251.611†	13451.6	8.30688	mg/L	0.036055	8.30688	mg/L	0.036055	0.43%
SIO2 251.611†	13451.6	17.7722	mg/L	0.07715	17.7722	mg/L	0.07715	0.43%
Sn 189.927†	69.8	0.023142	mg/L	0.0047728	0.023142	mg/L	0.0047728	20.62%
Sr 421.552†	62667.3	0.224023	mg/L	0.0001656	0.224023	mg/L	0.0001656	0.07%
Ti 336.121†	1135852.5	3.08579	mg/L	0.007380	3.08579	mg/L	0.007380	0.24%
Tl 190.801†	-66.5	-0.005769	mg/L	0.0010534	-0.005769	mg/L	0.0010534	18.26%
U 385.958†	15017.2	2.03957	mg/L	0.027239	2.03957	mg/L	0.027239	1.34%
V 292.402†	5295.1	0.330224	mg/L	0.0009453	0.330224	mg/L	0.0009453	0.29%
Zn 206.200†	26169.0	4.39553	mg/L	0.003138	4.39553	mg/L	0.003138	0.07%

Sequence No.: 10
Sample ID: W9D0292-04@20X
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 53
Date Collected: 4/28/2009 11:03:26 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0292-04@20X

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	66150.5	107.515	%	0.0433				0.04%
Lu 261.542 A	733292.5	105.220	%	0.2288				0.22%
Ag 328.068†	80.7	0.002469	mg/L	0.0000076	0.002469	mg/L	0.0000076	0.31%
Al 308.215 †	16705.8	8.55997	mg/L	0.064042	8.55997	mg/L	0.064042	0.75%
As 188.979†	96.0	0.107737	mg/L	0.0009638	0.107737	mg/L	0.0009638	0.89%
B 249.677†	2.9	0.005997	mg/L	0.0017096	0.005997	mg/L	0.0017096	28.51%
Ba 233.527 A†	10674.4	0.094281	mg/L	0.0001236	0.094281	mg/L	0.0001236	0.13%
Be 313.107 R†	12.7	0.000305	mg/L	0.0000275	0.000305	mg/L	0.0000275	9.04%
Bi 222.821†	35.3	0.015479	mg/L	0.0113276	0.015479	mg/L	0.0113276	73.18%
Ca 315.887 †	133344.9	37.4668	mg/L	0.13406	37.4668	mg/L	0.13406	0.36%
Cd 226.502†	23.3	0.002127	mg/L	0.0001236	0.002127	mg/L	0.0001236	5.81%
Ce 418.660†	781.3	0.022223	mg/L	0.0000704	0.022223	mg/L	0.0000704	0.32%
Co 228.616†	217.8	0.007542	mg/L	0.0001214	0.007542	mg/L	0.0001214	1.61%
Cr 267.716†	136.6	0.015081	mg/L	0.0002900	0.015081	mg/L	0.0002900	1.92%
Cu 324.752†	527465.6	1.98025	mg/L	0.016524	1.98025	mg/L	0.016524	0.83%
Fe 273.955 †	15704.8	14.4260	mg/L	0.02162	14.4260	mg/L	0.02162	0.15%
Ga 417.206†	454.1	0.002541	mg/L	0.0000374	0.002541	mg/L	0.0000374	1.47%
K 766.490 †	2042.7	0.914111	mg/L	0.0015988	0.914111	mg/L	0.0015988	0.17%
La 379.478†	2273.2	0.008908	mg/L	0.0002700	0.008908	mg/L	0.0002700	3.03%
Li 670.784†	1017.8	0.010557	mg/L	0.0003453	0.010557	mg/L	0.0003453	3.27%
Mg 279.077 †	4707.0	10.8327	mg/L	0.05079	10.8327	mg/L	0.05079	0.47%
Mn 260.568†	12220.4	0.796026	mg/L	0.0018919	0.796026	mg/L	0.0018919	0.24%
Mo 202.031†	14.3	0.007175	mg/L	0.0002113	0.007175	mg/L	0.0002113	2.95%
Na 589.592†	300.8	0.057777	mg/L	0.0017461	0.057777	mg/L	0.0017461	3.02%
Ni 232.003†	48.2	0.030625	mg/L	0.0012258	0.030625	mg/L	0.0012258	4.00%
P 213.617†	187.1	0.430232	mg/L	0.0049556	0.430232	mg/L	0.0049556	1.15%
Pb 220.353†	140.6	0.145073	mg/L	0.0012200	0.145073	mg/L	0.0012200	0.84%
Sb 206.836†	1.5	0.001510	mg/L	0.0017263	0.001510	mg/L	0.0017263	114.31%
Sc 361.383†	2374.5	0.002270	mg/L	0.0000092	0.002270	mg/L	0.0000092	0.41%
Se 196.026†	-1.3	-0.001010	mg/L	0.0025706	-0.001010	mg/L	0.0025706	254.50%
Si 251.611†	756.8	0.465358	mg/L	0.0015455	0.465358	mg/L	0.0015455	0.33%
SIO2 251.611†	756.8	0.995093	mg/L	0.0033133	0.995093	mg/L	0.0033133	0.33%
Sn 189.927†	27.3	0.029967	mg/L	0.0015545	0.029967	mg/L	0.0015545	5.19%
Sr 421.552†	6248.9	0.022297	mg/L	0.0000377	0.022297	mg/L	0.0000377	0.17%
Ti 336.121†	174531.8	0.474624	mg/L	0.0016296	0.474624	mg/L	0.0016296	0.34%
Tl 190.801†	-4.7	0.001478	mg/L	0.0001967	0.001478	mg/L	0.0001967	13.31%
U 385.958†	864.3	0.093406	mg/L	0.0030822	0.093406	mg/L	0.0030822	3.30%
V 292.402†	417.9	0.025986	mg/L	0.0000395	0.025986	mg/L	0.0000395	0.15%
Zn 206.200†	1649.8	0.276976	mg/L	0.0004950	0.276976	mg/L	0.0004950	0.18%

Sequence No.: 11
Sample ID: CCV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 6
Date Collected: 4/28/2009 11:09:10 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCV

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	67345.1	109.456	%	0.4903				0.45%
Lu 261.542 A	753871.1	108.173	%	0.3467				0.32%
Ag 328.068†	136159.0	1.96815	mg/L	0.006549	1.96815	mg/L	0.006549	0.33%
QC value within limits for Ag 328.068 Recovery = 98.41%								
Al 308.215 †	4005.8	2.03017	mg/L	0.011180	2.03017	mg/L	0.011180	0.55%
QC value within limits for Al 308.215 Recovery = 101.51%								
As 188.979†	1877.1	1.99402	mg/L	0.003892	1.99402	mg/L	0.003892	0.20%
QC value within limits for As 188.979 Recovery = 99.70%								
B 249.677†	1353.6	1.99166	mg/L	0.007662	1.99166	mg/L	0.007662	0.38%
QC value within limits for B 249.677 Recovery = 99.58%								
Ba 233.527 A†	223227.6	1.98778	mg/L	0.005344	1.98778	mg/L	0.005344	0.27%
QC value within limits for Ba 233.527 A Recovery = 99.39%								
Be 313.107 R†	77011.0	1.91843	mg/L	0.000650	1.91843	mg/L	0.000650	0.03%
QC value within limits for Be 313.107 R Recovery = 95.92%								
Bi 222.821†	2821.2	3.73623	mg/L	0.008279	3.73623	mg/L	0.008279	0.22%
QC value within limits for Bi 222.821 Recovery = 93.41%								
Ca 315.887 †	7296.6	2.03630	mg/L	0.009055	2.03630	mg/L	0.009055	0.44%
QC value within limits for Ca 315.887 Recovery = 101.82%								
Cd 226.502†	9561.9	1.99175	mg/L	0.008984	1.99175	mg/L	0.008984	0.45%
QC value within limits for Cd 226.502 Recovery = 99.59%								
Ce 418.660†	-358.2	-0.000927	mg/L	0.0000944	-0.000927	mg/L	0.0000944	10.19%
QC value within limits for Ce 418.660 Recovery = Not calculated								
Co 228.616†	50182.8	2.00177	mg/L	0.006250	2.00177	mg/L	0.006250	0.31%
QC value within limits for Co 228.616 Recovery = 100.09%								
Cr 267.716†	17294.9	2.00293	mg/L	0.008933	2.00293	mg/L	0.008933	0.45%
QC value within limits for Cr 267.716 Recovery = 100.15%								
Cu 324.752†	519774.4	1.94851	mg/L	0.004319	1.94851	mg/L	0.004319	0.22%
QC value within limits for Cu 324.752 Recovery = 97.43%								
Fe 273.955 †	2200.5	2.02322	mg/L	0.011243	2.02322	mg/L	0.011243	0.56%
QC value within limits for Fe 273.955 Recovery = 101.16%								
Ga 417.206†	271680.7	3.94675	mg/L	0.014760	3.94675	mg/L	0.014760	0.37%
QC value within limits for Ga 417.206 Recovery = 98.67%								
K 766.490 †	43268.8	19.3611	mg/L	0.01603	19.3611	mg/L	0.01603	0.08%
QC value within limits for K 766.490 Recovery = 96.81%								
La 379.478†	526302.8	3.81360	mg/L	0.004888	3.81360	mg/L	0.004888	0.13%
QC value within limits for La 379.478 Recovery = 95.34%								
Li 670.784†	362218.1	3.76714	mg/L	0.008063	3.76714	mg/L	0.008063	0.21%
QC value within limits for Li 670.784 Recovery = 94.18%								
Mg 279.077 †	872.8	2.04155	mg/L	0.002674	2.04155	mg/L	0.002674	0.13%
QC value within limits for Mg 279.077 Recovery = 102.08%								
Mn 260.568†	30238.3	1.97140	mg/L	0.005484	1.97140	mg/L	0.005484	0.28%
QC value within limits for Mn 260.568 Recovery = 98.57%								
Mo 202.031†	3038.8	1.98651	mg/L	0.005737	1.98651	mg/L	0.005737	0.29%
QC value within limits for Mo 202.031 Recovery = 99.33%								
Na 589.592†	104683.0	20.1098	mg/L	0.01187	20.1098	mg/L	0.01187	0.06%
QC value within limits for Na 589.592 Recovery = 100.55%								
Ni 232.003†	9899.3	1.99590	mg/L	0.007895	1.99590	mg/L	0.007895	0.40%
QC value within limits for Ni 232.003 Recovery = 99.80%								
P 213.617†	3739.8	9.09510	mg/L	0.010516	9.09510	mg/L	0.010516	0.12%
QC value within limits for P 213.617 Recovery = 90.95%								
Pb 220.353†	1830.9	1.93014	mg/L	0.001436	1.93014	mg/L	0.001436	0.07%
QC value within limits for Pb 220.353 Recovery = 96.51%								
Sb 206.836†	3973.2	1.95326	mg/L	0.007946	1.95326	mg/L	0.007946	0.41%
QC value within limits for Sb 206.836 Recovery = 97.66%								
Sc 361.383†	1008124.6	0.953207	mg/L	0.0020650	0.953207	mg/L	0.0020650	0.22%
QC value within limits for Sc 361.383 Recovery = 95.32%								
Se 196.026†	1449.3	1.95242	mg/L	0.006676	1.95242	mg/L	0.006676	0.34%
QC value within limits for Se 196.026 Recovery = 97.62%								
Si 251.611†	15542.9	9.54958	mg/L	0.046351	9.54958	mg/L	0.046351	0.49%
QC value within limits for Si 251.611 Recovery = 95.50%								

SIO2 251.611†	15542.9	20.4412 mg/L	0.09920	20.4412 mg/L	0.09920	0.49%
QC value within limits for SIO2 251.611 Recovery = 95.52%						
Sn 189.927†	2750.3	3.91436 mg/L	0.009637	3.91436 mg/L	0.009637	0.25%
QC value within limits for Sn 189.927 Recovery = 97.86%						
Sr 421.552†	524694.6	1.91139 mg/L	0.003103	1.91139 mg/L	0.003103	0.16%
QC value within limits for Sr 421.552 Recovery = 95.57%						
Ti 336.121†	775746.8	1.96504 mg/L	0.006899	1.96504 mg/L	0.006899	0.35%
QC value within limits for Ti 336.121 Recovery = 98.25%						
Tl 190.801†	1733.4	2.01064 mg/L	0.003210	2.01064 mg/L	0.003210	0.16%
QC value within limits for Tl 190.801 Recovery = 100.53%						
U 385.958†	4401.7	0.924582 mg/L	0.0080203	0.924582 mg/L	0.0080203	0.87%
V 292.402†	31694.9	2.02996 mg/L	0.008070	2.02996 mg/L	0.008070	0.40%
QC value within limits for V 292.402 Recovery = 101.50%						
Zn 206.200†	11733.3	1.97429 mg/L	0.011135	1.97429 mg/L	0.011135	0.56%
QC value within limits for Zn 206.200 Recovery = 98.71%						

All analyte(s) passed QC.

Sequence No.: 12 Autosampler Location: 1
Sample ID: CCB Date Collected: 4/28/2009 11:15:39 AM
Analyst: Data Type: Original
Initial Sample Wt: Initial Sample Vol:
Dilution: Sample Prep Vol:

Mean Data: CCB

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	66125.2	107.473	%	0.7008				0.65%
Lu 261.542 A	745437.8	106.963	%	0.2597				0.24%
Ag 328.068†	-10.7	-0.000145	mg/L	0.0000089	-0.000145	mg/L	0.0000089	6.19%
QC value within limits for Ag 328.068 Recovery = Not calculated								
Al 308.215 †	-6.8	-0.003536	mg/L	0.0005112	-0.003536	mg/L	0.0005112	14.46%
QC value within limits for Al 308.215 Recovery = Not calculated								
As 188.979†	2.9	0.003307	mg/L	0.0008309	0.003307	mg/L	0.0008309	25.13%
QC value within limits for As 188.979 Recovery = Not calculated								
B 249.677†	2.0	0.002889	mg/L	0.0025988	0.002889	mg/L	0.0025988	89.96%
QC value within limits for B 249.677 Recovery = Not calculated								
Ba 233.527 A†	36.6	0.000330	mg/L	0.0000185	0.000330	mg/L	0.0000185	5.61%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 R†	-0.0	-0.000003	mg/L	0.0000334	-0.000003	mg/L	0.0000334	>999.9%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821†	7.2	0.009641	mg/L	0.0004389	0.009641	mg/L	0.0004389	4.55%
QC value within limits for Bi 222.821 Recovery = Not calculated								
Ca 315.887 †	4.1	0.001207	mg/L	0.0006714	0.001207	mg/L	0.0006714	55.65%
QC value within limits for Ca 315.887 Recovery = Not calculated								
Cd 226.502†	-0.4	-0.000075	mg/L	0.0000410	-0.000075	mg/L	0.0000410	54.71%
QC value within limits for Cd 226.502 Recovery = Not calculated								
Ce 418.660†	16.4	0.000449	mg/L	0.0000295	0.000449	mg/L	0.0000295	6.56%
Co 228.616†	-2.0	-0.000080	mg/L	0.0000301	-0.000080	mg/L	0.0000301	37.53%
QC value within limits for Co 228.616 Recovery = Not calculated								
Cr 267.716†	-3.5	-0.000395	mg/L	0.0002650	-0.000395	mg/L	0.0002650	67.11%
QC value within limits for Cr 267.716 Recovery = Not calculated								
Cu 324.752†	760.9	0.002864	mg/L	0.0000225	0.002864	mg/L	0.0000225	0.79%
QC value within limits for Cu 324.752 Recovery = Not calculated								
Fe 273.955 †	9.8	0.008961	mg/L	0.0036829	0.008961	mg/L	0.0036829	41.10%
QC value within limits for Fe 273.955 Recovery = Not calculated								
Ga 417.206†	10.0	0.000143	mg/L	0.0000471	0.000143	mg/L	0.0000471	32.93%
QC value within limits for Ga 417.206 Recovery = Not calculated								
K 766.490 †	8.5	0.003819	mg/L	0.0089253	0.003819	mg/L	0.0089253	233.73%
QC value within limits for K 766.490 Recovery = Not calculated								
La 379.478†	56.3	0.000395	mg/L	0.0001326	0.000395	mg/L	0.0001326	33.56%
QC value within limits for La 379.478 Recovery = Not calculated								
Li 670.784†	-49.0	-0.000509	mg/L	0.0000384	-0.000509	mg/L	0.0000384	7.55%
QC value within limits for Li 670.784 Recovery = Not calculated								
Mg 279.077 †	-0.3	-0.000761	mg/L	0.0015798	-0.000761	mg/L	0.0015798	207.66%
QC value within limits for Mg 279.077 Recovery = Not calculated								
Mn 260.568†	3.5	0.000225	mg/L	0.0000292	0.000225	mg/L	0.0000292	12.99%
QC value within limits for Mn 260.568 Recovery = Not calculated								
Mo 202.031†	1.5	0.001011	mg/L	0.0004609	0.001011	mg/L	0.0004609	45.61%
QC value within limits for Mo 202.031 Recovery = Not calculated								
Na 589.592†	5.0	0.000959	mg/L	0.0005536	0.000959	mg/L	0.0005536	57.71%
QC value within limits for Na 589.592 Recovery = Not calculated								
Ni 232.003†	5.9	0.001246	mg/L	0.0005760	0.001246	mg/L	0.0005760	46.24%
QC value within limits for Ni 232.003 Recovery = Not calculated								
P 213.617†	-0.5	-0.001344	mg/L	0.0005554	-0.001344	mg/L	0.0005554	41.34%
QC value within limits for P 213.617 Recovery = Not calculated								
Pb 220.353†	0.5	0.000577	mg/L	0.0013376	0.000577	mg/L	0.0013376	231.96%
QC value within limits for Pb 220.353 Recovery = Not calculated								
Sb 206.836†	-5.1	-0.002540	mg/L	0.0000007	-0.002540	mg/L	0.0000007	0.03%
QC value within limits for Sb 206.836 Recovery = Not calculated								
Sc 361.383†	33.7	0.000032	mg/L	0.0000201	0.000032	mg/L	0.0000201	63.26%
QC value within limits for Sc 361.383 Recovery = Not calculated								
Se 196.026†	-2.6	-0.003440	mg/L	0.0004867	-0.003440	mg/L	0.0004867	14.15%
QC value within limits for Se 196.026 Recovery = Not calculated								
Si 251.611†	2.1	0.001242	mg/L	0.0002651	0.001242	mg/L	0.0002651	21.35%
QC value within limits for Si 251.611 Recovery = Not calculated								
SIO2 251.611†	2.1	0.002662	mg/L	0.0005694	0.002662	mg/L	0.0005694	21.39%

QC value within limits for SIO2 251.611 Recovery = Not calculated

Sn 189.927†	2.1	0.002929 mg/L	0.0013858	0.002929 mg/L	0.0013858	47.31%

QC value within limits for Sn 189.927 Recovery = Not calculated

Sr 421.552†	16.4	0.000060 mg/L	0.0000043	0.000060 mg/L	0.0000043	7.26%

QC value within limits for Sr 421.552 Recovery = Not calculated

Ti 336.121†	23.7	0.000061 mg/L	0.0000155	0.000061 mg/L	0.0000155	25.43%

QC value within limits for Ti 336.121 Recovery = Not calculated

Tl 190.801†	2.8	0.003232 mg/L	0.0009285	0.003232 mg/L	0.0009285	28.73%

QC value within limits for Tl 190.801 Recovery = Not calculated

U 385.958†	-35.9	-0.009070 mg/L	0.0008390	-0.009070 mg/L	0.0008390	9.25%
V 292.402†	2.3	0.000141 mg/L	0.0000397	0.000141 mg/L	0.0000397	28.04%

QC value within limits for V 292.402 Recovery = Not calculated

Zn 206.200†	-0.4	-0.000063 mg/L	0.0004553	-0.000063 mg/L	0.0004553	719.74%

QC value within limits for Zn 206.200 Recovery = Not calculated

All analyte(s) passed QC.

Sequence No.: 13
Sample ID: W9D0292-06
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 47
Date Collected: 4/28/2009 11:21:36 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0292-06

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Calib Std.Dev.	Sample Conc.	Sample Units	Sample Std.Dev.	RSD
Lu 261.542 R	64538.3	104.894	%	0.5988				0.57%
Lu 261.542 A	666635.8	95.6556	%	0.33521				0.35%
Ag 328.068†	2408.9	0.053882	mg/L	0.0002065	0.053882	mg/L	0.0002065	0.38%
Al 308.215 †	310670.1	159.203	mg/L	0.4445	159.203	mg/L	0.4445	0.28%
As 188.979†	2230.6	2.51336	mg/L	0.005552	2.51336	mg/L	0.005552	0.22%
B 249.677†	29.0	0.065534	mg/L	0.0021552	0.065534	mg/L	0.0021552	3.29%
Ba 233.527 A†	173517.1	1.53189	mg/L	0.007518	1.53189	mg/L	0.007518	0.49%
Be 313.107 R†	353.6	0.009131	mg/L	0.0000709	0.009131	mg/L	0.0000709	0.78%
Bi 222.821†	714.9	0.503701	mg/L	0.0120928	0.503701	mg/L	0.0120928	2.40%
Ca 315.887 †	1243666.2	349.437	mg/L	0.3130	349.437	mg/L	0.3130	0.09%
Cd 226.502†	477.6	0.061082	mg/L	0.0002580	0.061082	mg/L	0.0002580	0.42%
Ce 418.660†	13905.7	0.388602	mg/L	0.0012390	0.388602	mg/L	0.0012390	0.32%
Co 228.616†	2440.1	0.087040	mg/L	0.0000655	0.087040	mg/L	0.0000655	0.08%
Cr 267.716†	1844.9	0.204825	mg/L	0.0000887	0.204825	mg/L	0.0000887	0.04%
Cu 324.752†	10055599.9	37.7500	mg/L	0.15499	37.7500	mg/L	0.15499	0.41%
Fe 273.955 †	229169.9	210.509	mg/L	0.0628	210.509	mg/L	0.0628	0.03%
Ga 417.206†	7445.2	0.052269	mg/L	0.0001546	0.052269	mg/L	0.0001546	0.30%
K 766.490 †	71267.1	31.8909	mg/L	0.08981	31.8909	mg/L	0.08981	0.28%
La 379.478†	51313.9	0.255912	mg/L	0.0034437	0.255912	mg/L	0.0034437	1.35%
Li 670.784†	13973.2	0.145117	mg/L	0.0005008	0.145117	mg/L	0.0005008	0.35%
Mg 279.077 †	32174.5	74.0540	mg/L	0.02103	74.0540	mg/L	0.02103	0.03%
Mn 260.568†	140503.9	9.15162	mg/L	0.006394	9.15162	mg/L	0.006394	0.07%
Mo 202.031†	40.7	0.007012	mg/L	0.0002252	0.007012	mg/L	0.0002252	3.21%
Na 589.592†	4131.7	0.793709	mg/L	0.0024320	0.793709	mg/L	0.0024320	0.31%
Ni 232.003†	-426.2	0.213080	mg/L	0.0031224	0.213080	mg/L	0.0031224	1.47%
P 213.617†	3254.6	7.38499	mg/L	0.009408	7.38499	mg/L	0.009408	0.13%
Pb 220.353†	2937.7	3.04162	mg/L	0.016167	3.04162	mg/L	0.016167	0.53%
Sb 206.836†	83.7	0.052745	mg/L	0.0026696	0.052745	mg/L	0.0026696	5.06%
Sc 361.383†	32677.7	0.031308	mg/L	0.0000544	0.031308	mg/L	0.0000544	0.17%
Se 196.026†	-7.8	0.010166	mg/L	0.0034529	0.010166	mg/L	0.0034529	33.97%
Si 251.611†	16983.3	10.4857	mg/L	0.01109	10.4857	mg/L	0.01109	0.11%
SIO2 251.611†	16983.3	22.4337	mg/L	0.02373	22.4337	mg/L	0.02373	0.11%
Sn 189.927†	83.6	0.042543	mg/L	0.0003789	0.042543	mg/L	0.0003789	0.89%
Sr 421.552†	79375.4	0.284777	mg/L	0.0010954	0.284777	mg/L	0.0010954	0.38%
Ti 336.121†	1220731.1	3.31629	mg/L	0.002265	3.31629	mg/L	0.002265	0.07%
Tl 190.801†	-79.0	-0.007306	mg/L	0.0032737	-0.007306	mg/L	0.0032737	44.81%
U 385.958†	15533.7	2.10108	mg/L	0.022282	2.10108	mg/L	0.022282	1.06%
V 292.402†	5277.1	0.328812	mg/L	0.0014356	0.328812	mg/L	0.0014356	0.44%
Zn 206.200†	32261.8	5.42111	mg/L	0.038464	5.42111	mg/L	0.038464	0.71%

Sequence No.: 14
Sample ID: W9D0292-07
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 48
Date Collected: 4/28/2009 11:28:48 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0292-07

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	64059.3	104.116	%	0.0709				0.07%
Lu 261.542 A	680298.5	97.6161	%	0.02602				0.03%
Ag 328.068†	1125.0	0.034394	mg/L	0.0003789	0.034394	mg/L	0.0003789	1.10%
Al 308.215 †	329870.5	169.042	mg/L	1.0220	169.042	mg/L	1.0220	0.60%
As 188.979†	1445.1	1.62376	mg/L	0.001657	1.62376	mg/L	0.001657	0.10%
B 249.677†	34.0	0.072145	mg/L	0.0021424	0.072145	mg/L	0.0021424	2.97%
Ba 233.527 A†	183590.0	1.62097	mg/L	0.000562	1.62097	mg/L	0.000562	0.03%
Be 313.107 R†	338.4	0.008630	mg/L	0.0001229	0.008630	mg/L	0.0001229	1.42%
Bi 222.821†	519.1	0.242542	mg/L	0.0172322	0.242542	mg/L	0.0172322	7.10%
Ca 315.887 †	824979.8	231.798	mg/L	1.1910	231.798	mg/L	1.1910	0.51%
Cd 226.502†	395.9	0.042246	mg/L	0.0004592	0.042246	mg/L	0.0004592	1.09%
Ce 418.660†	13787.6	0.383759	mg/L	0.0012887	0.383759	mg/L	0.0012887	0.34%
Co 228.616†	2642.4	0.092076	mg/L	0.0003157	0.092076	mg/L	0.0003157	0.34%
Cr 267.716†	2288.4	0.255489	mg/L	0.0013351	0.255489	mg/L	0.0013351	0.52%
Cu 324.752†	5497719.8	20.6426	mg/L	0.00418	20.6426	mg/L	0.00418	0.02%
Fe 273.955 †	236834.4	217.551	mg/L	1.4103	217.551	mg/L	1.4103	0.65%
Ga 417.206†	7594.9	0.048220	mg/L	0.0004661	0.048220	mg/L	0.0004661	0.97%
K 766.490 †	74928.2	33.5291	mg/L	0.37560	33.5291	mg/L	0.37560	1.12%
La 379.478†	52010.5	0.252789	mg/L	0.0008099	0.252789	mg/L	0.0008099	0.32%
Li 670.784†	14758.5	0.152915	mg/L	0.0009508	0.152915	mg/L	0.0009508	0.62%
Mg 279.077 †	62080.3	142.904	mg/L	0.9699	142.904	mg/L	0.9699	0.68%
Mn 260.568†	252823.0	16.4749	mg/L	0.11658	16.4749	mg/L	0.11658	0.71%
Mo 202.031†	64.8	0.029997	mg/L	0.0008014	0.029997	mg/L	0.0008014	2.67%
Na 589.592†	5570.8	1.07016	mg/L	0.001112	1.07016	mg/L	0.001112	0.10%
Ni 232.003†	-245.2	0.271046	mg/L	0.0093378	0.271046	mg/L	0.0093378	3.45%
P 213.617†	3108.5	7.34030	mg/L	0.034860	7.34030	mg/L	0.034860	0.47%
Pb 220.353†	3104.6	3.23038	mg/L	0.015087	3.23038	mg/L	0.015087	0.47%
Sb 206.836†	45.5	0.033534	mg/L	0.0007979	0.033534	mg/L	0.0007979	2.38%
Sc 361.383†	37448.4	0.035565	mg/L	0.0000657	0.035565	mg/L	0.0000657	0.18%
Se 196.026†	-11.5	-0.001081	mg/L	0.0046050	-0.001081	mg/L	0.0046050	425.96%
Si 251.611†	16776.1	10.3455	mg/L	0.06625	10.3455	mg/L	0.06625	0.64%
SIO2 251.611†	16776.1	22.1286	mg/L	0.14170	22.1286	mg/L	0.14170	0.64%
Sn 189.927†	63.4	0.050384	mg/L	0.0033606	0.050384	mg/L	0.0033606	6.67%
Sr 421.552†	82062.6	0.296025	mg/L	0.0010703	0.296025	mg/L	0.0010703	0.36%
Ti 336.121†	1707579.4	4.64175	mg/L	0.002988	4.64175	mg/L	0.002988	0.06%
Tl 190.801†	-123.1	-0.001710	mg/L	0.0019669	-0.001710	mg/L	0.0019669	115.00%
U 385.958†	15540.1	2.04357	mg/L	0.032087	2.04357	mg/L	0.032087	1.57%
V 292.402†	5955.0	0.371442	mg/L	0.0012788	0.371442	mg/L	0.0012788	0.34%
Zn 206.200†	35049.4	5.88761	mg/L	0.027171	5.88761	mg/L	0.027171	0.46%

Sequence No.: 15
Sample ID: W9D0292-08
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 49
Date Collected: 4/28/2009 11:35:14 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0292-08

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	64183.2	104.317	%	0.2482				0.24%
Lu 261.542 A	673206.0	96.5984	%	0.16172				0.17%
Ag 328.068†	2636.5	0.057369	mg/L	0.0007165	0.057369	mg/L	0.0007165	1.25%
Al 308.215 †	333058.1	170.677	mg/L	0.8823	170.677	mg/L	0.8823	0.52%
As 188.979†	2412.4	2.72243	mg/L	0.001889	2.72243	mg/L	0.001889	0.07%
B 249.677†	36.8	0.077759	mg/L	0.0022544	0.077759	mg/L	0.0022544	2.90%
Ba 233.527 A†	174680.0	1.54187	mg/L	0.005421	1.54187	mg/L	0.005421	0.35%
Be 313.107 R†	341.4	0.008804	mg/L	0.0000632	0.008804	mg/L	0.0000632	0.72%
Bi 222.821†	757.0	0.528849	mg/L	0.0035144	0.528849	mg/L	0.0035144	0.66%
Ca 315.887 †	1002906.4	281.790	mg/L	1.1320	281.790	mg/L	1.1320	0.40%
Cd 226.502†	501.1	0.062287	mg/L	0.0002623	0.062287	mg/L	0.0002623	0.42%
Ce 418.660†	13233.8	0.370081	mg/L	0.0016976	0.370081	mg/L	0.0016976	0.46%
Co 228.616†	2616.8	0.091659	mg/L	0.0004579	0.091659	mg/L	0.0004579	0.50%
Cr 267.716†	2223.7	0.247092	mg/L	0.0003823	0.247092	mg/L	0.0003823	0.15%
Cu 324.752†	9100599.3	34.1656	mg/L	0.06011	34.1656	mg/L	0.06011	0.18%
Fe 273.955 †	250850.1	230.426	mg/L	0.6474	230.426	mg/L	0.6474	0.28%
Ga 417.206†	8052.9	0.054313	mg/L	0.0004136	0.054313	mg/L	0.0004136	0.76%
K 766.490 †	76852.7	34.3902	mg/L	0.33974	34.3902	mg/L	0.33974	0.99%
La 379.478†	54195.5	0.262576	mg/L	0.0003475	0.262576	mg/L	0.0003475	0.13%
Li 670.784†	14580.0	0.151063	mg/L	0.0007778	0.151063	mg/L	0.0007778	0.51%
Mg 279.077 †	66065.5	152.067	mg/L	0.8343	152.067	mg/L	0.8343	0.55%
Mn 260.568†	247525.1	16.1285	mg/L	0.06589	16.1285	mg/L	0.06589	0.41%
Mo 202.031†	49.9	0.017095	mg/L	0.0002292	0.017095	mg/L	0.0002292	1.34%
Na 589.592†	5478.0	1.05233	mg/L	0.002033	1.05233	mg/L	0.002033	0.19%
Ni 232.003†	-390.6	0.261855	mg/L	0.0005497	0.261855	mg/L	0.0005497	0.21%
P 213.617†	3581.7	8.25913	mg/L	0.036705	8.25913	mg/L	0.036705	0.44%
Pb 220.353†	4931.6	5.14176	mg/L	0.023873	5.14176	mg/L	0.023873	0.46%
Sb 206.836†	101.1	0.062310	mg/L	0.0012966	0.062310	mg/L	0.0012966	2.08%
Sc 361.383†	38480.9	0.036625	mg/L	0.0001255	0.036625	mg/L	0.0001255	0.34%
Se 196.026†	-12.9	-0.001156	mg/L	0.0021803	-0.001156	mg/L	0.0021803	188.61%
Si 251.611†	14131.4	8.71201	mg/L	0.041943	8.71201	mg/L	0.041943	0.48%
SIO2 251.611†	14131.4	18.6323	mg/L	0.08969	18.6323	mg/L	0.08969	0.48%
Sn 189.927†	80.4	0.059800	mg/L	0.0033133	0.059800	mg/L	0.0033133	5.54%
Sr 421.552†	87620.4	0.315654	mg/L	0.0011955	0.315654	mg/L	0.0011955	0.38%
Ti 336.121†	1549325.4	4.20980	mg/L	0.014962	4.20980	mg/L	0.014962	0.36%
Tl 190.801†	-121.6	-0.001653	mg/L	0.0011450	-0.001653	mg/L	0.0011450	69.26%
U 385.958†	16816.9	2.25405	mg/L	0.015828	2.25405	mg/L	0.015828	0.70%
V 292.402†	6453.6	0.402980	mg/L	0.0018058	0.402980	mg/L	0.0018058	0.45%
Zn 206.200†	48003.6	8.07079	mg/L	0.018645	8.07079	mg/L	0.018645	0.23%

Sequence No.: 16
Sample ID: W9D0292-09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 50
Date Collected: 4/28/2009 11:41:40 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0292-09

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	61845.4	100.518	%	0.5247				0.52%
Lu 261.542 A	651936.1	93.5464	%	0.03288				0.04%
Ag 328.068†	910.0	0.029206	mg/L	0.0000061	0.029206	mg/L	0.0000061	0.02%
Al 308.215 †	292271.1	149.763	mg/L	1.2486	149.763	mg/L	1.2486	0.83%
As 188.979†	1875.6	2.09649	mg/L	0.007211	2.09649	mg/L	0.007211	0.34%
B 249.677†	51.6	0.102957	mg/L	0.0033906	0.102957	mg/L	0.0033906	3.29%
Ba 233.527 A†	137575.9	1.21426	mg/L	0.000164	1.21426	mg/L	0.000164	0.01%
Be 313.107 R†	302.5	0.007787	mg/L	0.0000036	0.007787	mg/L	0.0000036	0.05%
Bi 222.821†	416.6	0.138366	mg/L	0.0029798	0.138366	mg/L	0.0029798	2.15%
Ca 315.887 †	2828188.7	794.648	mg/L	6.6783	794.648	mg/L	6.6783	0.84%
Cd 226.502†	320.4	0.030206	mg/L	0.0000844	0.030206	mg/L	0.0000844	0.28%
Ce 418.660†	12735.2	0.362806	mg/L	0.0019685	0.362806	mg/L	0.0019685	0.54%
Co 228.616†	2186.6	0.076368	mg/L	0.0002741	0.076368	mg/L	0.0002741	0.36%
Cr 267.716†	1665.5	0.178276	mg/L	0.0000315	0.178276	mg/L	0.0000315	0.02%
Cu 324.752†	2579160.3	9.68517	mg/L	0.047202	9.68517	mg/L	0.047202	0.49%
Fe 273.955 †	197808.5	181.707	mg/L	0.7961	181.707	mg/L	0.7961	0.44%
Ga 417.206†	6636.0	0.052573	mg/L	0.0005786	0.052573	mg/L	0.0005786	1.10%
K 766.490 †	83379.0	37.3104	mg/L	0.05238	37.3104	mg/L	0.05238	0.14%
La 379.478†	46208.6	0.250475	mg/L	0.0036949	0.250475	mg/L	0.0036949	1.48%
Li 670.784†	13279.6	0.137737	mg/L	0.0000397	0.137737	mg/L	0.0000397	0.03%
Mg 279.077 †	113893.8	262.077	mg/L	0.6848	262.077	mg/L	0.6848	0.26%
Mn 260.568†	184661.2	12.0277	mg/L	0.03455	12.0277	mg/L	0.03455	0.29%
Mo 202.031†	52.5	-0.012636	mg/L	0.0006328	-0.012636	mg/L	0.0006328	5.01%
Na 589.592†	4562.3	0.876427	mg/L	0.0056811	0.876427	mg/L	0.0056811	0.65%
Ni 232.003†	-280.7	0.198092	mg/L	0.0009904	0.198092	mg/L	0.0009904	0.50%
P 213.617†	2825.9	6.83752	mg/L	0.005979	6.83752	mg/L	0.005979	0.09%
Pb 220.353†	1496.8	1.54706	mg/L	0.007633	1.54706	mg/L	0.007633	0.49%
Sb 206.836†	55.0	0.036734	mg/L	0.0012259	0.036734	mg/L	0.0012259	3.34%
Sc 361.383†	35101.6	0.033356	mg/L	0.0000704	0.033356	mg/L	0.0000704	0.21%
Se 196.026†	-15.5	-0.022338	mg/L	0.0141269	-0.022338	mg/L	0.0141269	63.24%
Si 251.611†	16592.2	10.2151	mg/L	0.03664	10.2151	mg/L	0.03664	0.36%
SIO2 251.611†	16592.2	21.8409	mg/L	0.07837	21.8409	mg/L	0.07837	0.36%
Sn 189.927†	72.2	-0.099821	mg/L	0.0080496	-0.099821	mg/L	0.0080496	8.06%
Sr 421.552†	142588.4	0.509540	mg/L	0.0040320	0.509540	mg/L	0.0040320	0.79%
Ti 336.121†	1385741.9	3.75842	mg/L	0.007709	3.75842	mg/L	0.007709	0.21%
Tl 190.801†	-94.6	-0.003783	mg/L	0.0012672	-0.003783	mg/L	0.0012672	33.49%
U 385.958†	14045.0	1.96316	mg/L	0.017787	1.96316	mg/L	0.017787	0.91%
V 292.402†	4733.4	0.294978	mg/L	0.0008293	0.294978	mg/L	0.0008293	0.28%
Zn 206.200†	29579.3	4.96906	mg/L	0.023402	4.96906	mg/L	0.023402	0.47%

Sequence No.: 17
Sample ID: W9D0292-10
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 51
Date Collected: 4/28/2009 11:48:18 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0292-10

Analyte	Mean Corrected Intensity	Calib Conc.	Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	61933.4	100.661	%	0.6702				0.67%
Lu 261.542 A	653168.8	93.7233	%	0.24747				0.26%
Ag 328.068†	3244.7	0.066505	mg/L	0.0001212	0.066505	mg/L	0.0001212	0.18%
Al 308.215 †	268790.5	137.737	mg/L	1.1759	137.737	mg/L	1.1759	0.85%
As 188.979†	2590.3	2.91310	mg/L	0.001966	2.91310	mg/L	0.001966	0.07%
B 249.677†	41.7	0.090160	mg/L	0.0015111	0.090160	mg/L	0.0015111	1.68%
Ba 233.527 A†	135772.3	1.19750	mg/L	0.001047	1.19750	mg/L	0.001047	0.09%
Be 313.107 R†	292.0	0.007616	mg/L	0.0001747	0.007616	mg/L	0.0001747	2.29%
Bi 222.821†	766.6	0.530484	mg/L	0.0042993	0.530484	mg/L	0.0042993	0.81%
Ca 315.887 †	2538136.9	713.151	mg/L	4.8809	713.151	mg/L	4.8809	0.68%
Cd 226.502†	452.4	0.052588	mg/L	0.0001070	0.052588	mg/L	0.0001070	0.20%
Ce 418.660†	11590.1	0.331600	mg/L	0.0009637	0.331600	mg/L	0.0009637	0.29%
Co 228.616†	2554.9	0.090769	mg/L	0.0000033	0.090769	mg/L	0.0000033	0.00%
Cr 267.716†	1632.5	0.175213	mg/L	0.0003970	0.175213	mg/L	0.0003970	0.23%
Cu 324.752†	10175658.8	38.1995	mg/L	0.26030	38.1995	mg/L	0.26030	0.68%
Fe 273.955 †	238877.0	219.430	mg/L	0.6578	219.430	mg/L	0.6578	0.30%
Ga 417.206†	7018.1	0.050071	mg/L	0.0004329	0.050071	mg/L	0.0004329	0.86%
K 766.490 †	81314.6	36.3865	mg/L	0.00762	36.3865	mg/L	0.00762	0.02%
La 379.478†	47863.4	0.237533	mg/L	0.0007149	0.237533	mg/L	0.0007149	0.30%
Li 670.784†	12387.9	0.128534	mg/L	0.0003723	0.128534	mg/L	0.0003723	0.29%
Mg 279.077 †	88897.0	204.552	mg/L	1.1520	204.552	mg/L	1.1520	0.56%
Mn 260.568†	155779.2	10.1438	mg/L	0.03125	10.1438	mg/L	0.03125	0.31%
Mo 202.031†	53.2	-0.007204	mg/L	0.0004180	-0.007204	mg/L	0.0004180	5.80%
Na 589.592†	4666.3	0.896403	mg/L	0.0000184	0.896403	mg/L	0.0000184	0.00%
Ni 232.003†	-468.4	0.215604	mg/L	0.0087315	0.215604	mg/L	0.0087315	4.05%
P 213.617†	3515.7	8.02595	mg/L	0.018789	8.02595	mg/L	0.018789	0.23%
Pb 220.353†	2967.7	3.06996	mg/L	0.032933	3.06996	mg/L	0.032933	1.07%
Sb 206.836†	78.2	0.052203	mg/L	0.0003032	0.052203	mg/L	0.0003032	0.58%
Sc 361.383†	34728.7	0.033280	mg/L	0.0001711	0.033280	mg/L	0.0001711	0.51%
Se 196.026†	-5.2	0.003588	mg/L	0.0093249	0.003588	mg/L	0.0093249	259.89%
Si 251.611†	16046.3	9.88821	mg/L	0.052488	9.88821	mg/L	0.052488	0.53%
SIO2 251.611†	16046.3	21.1455	mg/L	0.11222	21.1455	mg/L	0.11222	0.53%
Sn 189.927†	89.5	-0.053582	mg/L	0.0163397	-0.053582	mg/L	0.0163397	30.49%
Sr 421.552†	146626.2	0.525264	mg/L	0.0029056	0.525264	mg/L	0.0029056	0.55%
Ti 336.121†	1379142.0	3.74212	mg/L	0.009796	3.74212	mg/L	0.009796	0.26%
Tl 190.801†	-87.6	-0.008729	mg/L	0.0040122	-0.008729	mg/L	0.0040122	45.96%
U 385.958†	16505.6	2.26249	mg/L	0.040028	2.26249	mg/L	0.040028	1.77%
V 292.402†	4897.7	0.304252	mg/L	0.0008739	0.304252	mg/L	0.0008739	0.29%
Zn 206.200†	42507.1	7.14829	mg/L	0.042266	7.14829	mg/L	0.042266	0.59%

Sequence No.: 18
Sample ID: W9D0292-11
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 52
Date Collected: 4/28/2009 11:55:17 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0292-11

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	64333.0	104.561	%	0.2543				0.24%
Lu 261.542 A	675057.9	96.8641	%	0.35289				0.36%
Ag 328.068†	1301.3	0.036945	mg/L	0.0003066	0.036945	mg/L	0.0003066	0.83%
Al 308.215 †	327291.3	167.722	mg/L	1.2117	167.722	mg/L	1.2117	0.72%
As 188.979†	1301.1	1.45971	mg/L	0.000196	1.45971	mg/L	0.000196	0.01%
B 249.677†	32.5	0.070235	mg/L	0.0035557	0.070235	mg/L	0.0035557	5.06%
Ba 233.527 A†	186540.5	1.64706	mg/L	0.003907	1.64706	mg/L	0.003907	0.24%
Be 313.107 R†	343.8	0.008809	mg/L	0.0000482	0.008809	mg/L	0.0000482	0.55%
Bi 222.821†	525.4	0.245093	mg/L	0.0048601	0.245093	mg/L	0.0048601	1.98%
Ca 315.887 †	804781.0	226.122	mg/L	1.4724	226.122	mg/L	1.4724	0.65%
Cd 226.502†	392.6	0.041197	mg/L	0.0001118	0.041197	mg/L	0.0001118	0.27%
Ce 418.660†	14054.2	0.391095	mg/L	0.0015556	0.391095	mg/L	0.0015556	0.40%
Co 228.616†	2696.3	0.094573	mg/L	0.0004622	0.094573	mg/L	0.0004622	0.49%
Cr 267.716†	2306.1	0.257285	mg/L	0.0014930	0.257285	mg/L	0.0014930	0.58%
Cu 324.752†	6167412.7	23.1562	mg/L	0.02903	23.1562	mg/L	0.02903	0.13%
Fe 273.955 †	239879.6	220.348	mg/L	0.9346	220.348	mg/L	0.9346	0.42%
Ga 417.206†	7617.6	0.048274	mg/L	0.0007537	0.048274	mg/L	0.0007537	1.56%
K 766.490 †	72969.2	32.6525	mg/L	0.22388	32.6525	mg/L	0.22388	0.69%
La 379.478†	52456.7	0.254193	mg/L	0.0030192	0.254193	mg/L	0.0030192	1.19%
Li 670.784†	14241.8	0.147486	mg/L	0.0006012	0.147486	mg/L	0.0006012	0.41%
Mg 279.077 †	65694.8	151.227	mg/L	0.6631	151.227	mg/L	0.6631	0.44%
Mn 260.568†	270492.0	17.6269	mg/L	0.07167	17.6269	mg/L	0.07167	0.41%
Mo 202.031†	58.0	0.025897	mg/L	0.0008061	0.025897	mg/L	0.0008061	3.11%
Na 589.592†	5595.6	1.07492	mg/L	0.001401	1.07492	mg/L	0.001401	0.13%
Ni 232.003†	-225.8	0.282884	mg/L	0.0083423	0.282884	mg/L	0.0083423	2.95%
P 213.617†	2971.5	6.96249	mg/L	0.046442	6.96249	mg/L	0.046442	0.67%
Pb 220.353†	3261.2	3.39240	mg/L	0.023010	3.39240	mg/L	0.023010	0.68%
Sb 206.836†	41.5	0.032007	mg/L	0.0010971	0.032007	mg/L	0.0010971	3.43%
Sc 361.383†	37732.8	0.035797	mg/L	0.0003081	0.035797	mg/L	0.0003081	0.86%
Se 196.026†	-15.0	-0.006237	mg/L	0.0030232	-0.006237	mg/L	0.0030232	48.48%
Si 251.611†	16441.9	10.1395	mg/L	0.03056	10.1395	mg/L	0.03056	0.30%
SIO2 251.611†	16441.9	21.6871	mg/L	0.06535	21.6871	mg/L	0.06535	0.30%
Sn 189.927†	67.3	0.057045	mg/L	0.0001232	0.057045	mg/L	0.0001232	0.22%
Sr 421.552†	77452.3	0.279300	mg/L	0.0007397	0.279300	mg/L	0.0007397	0.26%
Ti 336.121†	1613607.8	4.38557	mg/L	0.018289	4.38557	mg/L	0.018289	0.42%
Tl 190.801†	-127.2	0.001911	mg/L	0.0016206	0.001911	mg/L	0.0016206	84.79%
U 385.958†	15930.1	2.11791	mg/L	0.016249	2.11791	mg/L	0.016249	0.77%
V 292.402†	5950.9	0.371321	mg/L	0.0020495	0.371321	mg/L	0.0020495	0.55%
Zn 206.200†	35584.5	5.97737	mg/L	0.012516	5.97737	mg/L	0.012516	0.21%

Sequence No.: 19 ZZZZZZ
Sample ID: ~~W9D0292-11@20X~~ KG 04/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 54
Date Collected: 4/28/2009 12:01:25 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

ZZZZZZ

Mean Data: ~~W9D0292-11@20X~~ KG 04/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	65816.8	106.972	%	0.3997				0.37%
Lu 261.542 A	741659.0	106.421	%	0.1322				0.12%
Ag 328.068†	54.1	0.001891	mg/L	0.0000296	0.001891	mg/L	0.0000296	1.56%
Al 308.215 †	18111.9	9.28119	mg/L	0.050561	9.28119	mg/L	0.050561	0.54%
As 188.979†	69.7	0.078361	mg/L	0.0006223	0.078361	mg/L	0.0006223	0.79%
B 249.677†	4.2	0.007542	mg/L	0.0005143	0.007542	mg/L	0.0005143	6.82%
Ba 233.527 A†	10041.7	0.088659	mg/L	0.0022823	0.088659	mg/L	0.0022823	2.57%
Be 313.107 R†	16.3	0.000405	mg/L	0.0000243	0.000405	mg/L	0.0000243	6.00%
Bi 222.821†	29.4	0.012403	mg/L	0.0003500	0.012403	mg/L	0.0003500	2.82%
Ca 315.887 †	46174.6	12.9743	mg/L	0.05898	12.9743	mg/L	0.05898	0.45%
Cd 226.502†	19.0	0.001545	mg/L	0.0002255	0.001545	mg/L	0.0002255	14.60%
Ce 418.660†	737.2	0.020545	mg/L	0.0006338	0.020545	mg/L	0.0006338	3.09%
Co 228.616†	142.0	0.004952	mg/L	0.0001626	0.004952	mg/L	0.0001626	3.28%
Cr 267.716†	123.0	0.013745	mg/L	0.0000910	0.013745	mg/L	0.0000910	0.66%
Cu 324.752†	294442.5	1.10568	mg/L	0.038569	1.10568	mg/L	0.038569	3.49%
Fe 273.955 †	14186.1	13.0309	mg/L	0.09735	13.0309	mg/L	0.09735	0.75%
Ga 417.206†	385.0	0.002117	mg/L	0.0002002	0.002117	mg/L	0.0002002	9.46%
K 766.490 †	4030.1	1.80341	mg/L	0.011126	1.80341	mg/L	0.011126	0.62%
La 379.478†	2136.3	0.007991	mg/L	0.0004508	0.007991	mg/L	0.0004508	5.64%
Li 670.784†	558.0	0.005764	mg/L	0.0001977	0.005764	mg/L	0.0001977	3.43%
Mg 279.077 †	3703.6	8.52597	mg/L	0.052860	8.52597	mg/L	0.052860	0.62%
Mn 260.568†	15863.4	1.03376	mg/L	0.007937	1.03376	mg/L	0.007937	0.77%
Mo 202.031†	9.3	0.005368	mg/L	0.0004169	0.005368	mg/L	0.0004169	7.77%
Na 589.592†	389.5	0.074827	mg/L	0.0000991	0.074827	mg/L	0.0000991	0.13%
Ni 232.003†	-8.1	0.017753	mg/L	0.0005534	0.017753	mg/L	0.0005534	3.12%
P 213.617†	149.5	0.352306	mg/L	0.0025645	0.352306	mg/L	0.0025645	0.73%
Pb 220.353†	172.7	0.179696	mg/L	0.0006720	0.179696	mg/L	0.0006720	0.37%
Sb 206.836†	-1.6	-0.000171	mg/L	0.0006310	-0.000171	mg/L	0.0006310	369.01%
Sc 361.383†	2017.0	0.001917	mg/L	0.0000562	0.001917	mg/L	0.0000562	2.93%
Se 196.026†	0.8	0.001810	mg/L	0.0013883	0.001810	mg/L	0.0013883	76.70%
Si 251.611†	972.9	0.600049	mg/L	0.0111098	0.600049	mg/L	0.0111098	1.85%
SIO2 251.611†	972.9	1.28347	mg/L	0.023772	1.28347	mg/L	0.023772	1.85%
Sn 189.927†	12.2	0.015084	mg/L	0.0008538	0.015084	mg/L	0.0008538	5.66%
Sr 421.552†	4395.5	0.015849	mg/L	0.0000323	0.015849	mg/L	0.0000323	0.20%
Ti 336.121†	84151.3	0.228688	mg/L	0.0068875	0.228688	mg/L	0.0068875	3.01%
Tl 190.801†	-7.2	0.000435	mg/L	0.0004490	0.000435	mg/L	0.0004490	103.19%
U 385.958†	698.1	0.064173	mg/L	0.0068873	0.064173	mg/L	0.0068873	10.73%
V 292.402†	294.3	0.018274	mg/L	0.0001480	0.018274	mg/L	0.0001480	0.81%
Zn 206.200†	1982.7	0.333008	mg/L	0.0070709	0.333008	mg/L	0.0070709	2.12%

Sequence No.: 20
Sample ID: CCV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 6
Date Collected: 4/28/2009 12:07:20 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCV

Analyte	Mean Corrected Intensity	Calib Conc.	Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	66754.1	108.496	%	0.4896				0.45%
Lu 261.542 A	755221.1	108.367	%	0.3311				0.31%
Ag 328.068†	135825.1	1.96333	mg/L	0.000113	1.96333	mg/L	0.000113	0.01%
QC value within limits for Ag 328.068 Recovery = 98.17%								
Al 308.215 †	3991.8	2.02300	mg/L	0.014319	2.02300	mg/L	0.014319	0.71%
QC value within limits for Al 308.215 Recovery = 101.15%								
As 188.979†	1885.5	2.00397	mg/L	0.010279	2.00397	mg/L	0.010279	0.51%
QC value within limits for As 188.979 Recovery = 100.20%								
B 249.677†	1346.7	1.98149	mg/L	0.014796	1.98149	mg/L	0.014796	0.75%
QC value within limits for B 249.677 Recovery = 99.07%								
Ba 233.527 A†	226386.1	2.01580	mg/L	0.006263	2.01580	mg/L	0.006263	0.31%
QC value within limits for Ba 233.527 A Recovery = 100.79%								
Be 313.107 R†	76341.8	1.90176	mg/L	0.007998	1.90176	mg/L	0.007998	0.42%
QC value within limits for Be 313.107 R Recovery = 95.09%								
Bi 222.821†	2794.0	3.69901	mg/L	0.004576	3.69901	mg/L	0.004576	0.12%
QC value within limits for Bi 222.821 Recovery = 92.48%								
Ca 315.887 †	7350.0	2.05133	mg/L	0.013810	2.05133	mg/L	0.013810	0.67%
QC value within limits for Ca 315.887 Recovery = 102.57%								
Cd 226.502†	9630.9	2.00611	mg/L	0.008741	2.00611	mg/L	0.008741	0.44%
QC value within limits for Cd 226.502 Recovery = 100.31%								
Ce 418.660†	-360.7	-0.000980	mg/L	0.0001315	-0.000980	mg/L	0.0001315	13.42%
QC value within limits for Ce 418.660 Recovery = Not calculated								
Co 228.616†	50722.0	2.02329	mg/L	0.001929	2.02329	mg/L	0.001929	0.10%
QC value within limits for Co 228.616 Recovery = 101.16%								
Cr 267.716†	17447.8	2.02065	mg/L	0.009159	2.02065	mg/L	0.009159	0.45%
QC value within limits for Cr 267.716 Recovery = 101.03%								
Cu 324.752†	518038.7	1.94199	mg/L	0.007901	1.94199	mg/L	0.007901	0.41%
QC value within limits for Cu 324.752 Recovery = 97.10%								
Fe 273.955 †	2217.1	2.03840	mg/L	0.008054	2.03840	mg/L	0.008054	0.40%
QC value within limits for Fe 273.955 Recovery = 101.92%								
Ga 417.206†	269102.3	3.90923	mg/L	0.003901	3.90923	mg/L	0.003901	0.10%
QC value within limits for Ga 417.206 Recovery = 97.73%								
K 766.490 †	42899.8	19.1960	mg/L	0.19569	19.1960	mg/L	0.19569	1.02%
QC value within limits for K 766.490 Recovery = 95.98%								
La 379.478†	525094.0	3.80479	mg/L	0.007463	3.80479	mg/L	0.007463	0.20%
QC value within limits for La 379.478 Recovery = 95.12%								
Li 670.784†	355349.5	3.69570	mg/L	0.009417	3.69570	mg/L	0.009417	0.25%
QC value within limits for Li 670.784 Recovery = 92.39%								
Mg 279.077 †	879.0	2.05594	mg/L	0.009467	2.05594	mg/L	0.009467	0.46%
QC value within limits for Mg 279.077 Recovery = 102.80%								
Mn 260.568†	30388.5	1.98119	mg/L	0.004101	1.98119	mg/L	0.004101	0.21%
QC value within limits for Mn 260.568 Recovery = 99.06%								
Mo 202.031†	3043.9	1.98984	mg/L	0.004283	1.98984	mg/L	0.004283	0.22%
QC value within limits for Mo 202.031 Recovery = 99.49%								
Na 589.592†	104508.0	20.0762	mg/L	0.06812	20.0762	mg/L	0.06812	0.34%
QC value within limits for Na 589.592 Recovery = 100.38%								
Ni 232.003†	9904.5	1.99650	mg/L	0.005761	1.99650	mg/L	0.005761	0.29%
QC value within limits for Ni 232.003 Recovery = 99.83%								
P 213.617†	3806.1	9.25667	mg/L	0.036545	9.25667	mg/L	0.036545	0.39%
QC value within limits for P 213.617 Recovery = 92.57%								
Pb 220.353†	1824.7	1.92368	mg/L	0.006126	1.92368	mg/L	0.006126	0.32%
QC value within limits for Pb 220.353 Recovery = 96.18%								
Sb 206.836†	3976.3	1.95466	mg/L	0.008736	1.95466	mg/L	0.008736	0.45%
QC value within limits for Sb 206.836 Recovery = 97.73%								
Sc 361.383†	1008509.2	0.953571	mg/L	0.0018670	0.953571	mg/L	0.0018670	0.20%
QC value within limits for Sc 361.383 Recovery = 95.36%								
Se 196.026†	1455.7	1.96080	mg/L	0.007488	1.96080	mg/L	0.007488	0.38%
QC value within limits for Se 196.026 Recovery = 98.04%								
Si 251.611†	15666.6	9.62579	mg/L	0.051997	9.62579	mg/L	0.051997	0.54%
QC value within limits for Si 251.611 Recovery = 96.26%								

SIO2 251.611†	15666.6	20.6043 mg/L	0.11130	20.6043 mg/L	0.11130	0.54%
QC value within limits for SIO2 251.611 Recovery = 96.28%						
Sn 189.927†	2768.4	3.94012 mg/L	0.020530	3.94012 mg/L	0.020530	0.52%
QC value within limits for Sn 189.927 Recovery = 98.50%						
Sr 421.552†	521509.2	1.89979 mg/L	0.005707	1.89979 mg/L	0.005707	0.30%
QC value within limits for Sr 421.552 Recovery = 94.99%						
Ti 336.121†	780313.6	1.97743 mg/L	0.003882	1.97743 mg/L	0.003882	0.20%
QC value within limits for Ti 336.121 Recovery = 98.87%						
Tl 190.801†	1751.1	2.03113 mg/L	0.006167	2.03113 mg/L	0.006167	0.30%
QC value within limits for Tl 190.801 Recovery = 101.56%						
U 385.958†	4381.0	0.919203 mg/L	0.0077207	0.919203 mg/L	0.0077207	0.84%
V 292.402†	31771.7	2.03488 mg/L	0.008021	2.03488 mg/L	0.008021	0.39%
QC value within limits for V 292.402 Recovery = 101.74%						
Zn 206.200†	11984.9	2.01669 mg/L	0.008779	2.01669 mg/L	0.008779	0.44%
QC value within limits for Zn 206.200 Recovery = 100.83%						

All analyte(s) passed QC.

Sequence No.: 21
Sample ID: CCB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 1
Date Collected: 4/28/2009 12:13:39 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCB

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	65616.3	106.646	%	0.2274				0.21%
Lu 261.542 A	753554.1	108.128	%	0.3525				0.33%
Ag 328.068†	3.2	0.000056	mg/L	0.0000471	0.000056	mg/L	0.0000471	84.64%
QC value within limits for Ag 328.068 Recovery = Not calculated								
Al 308.215 †	-6.8	-0.003567	mg/L	0.0001505	-0.003567	mg/L	0.0001505	4.22%
QC value within limits for Al 308.215 Recovery = Not calculated								
As 188.979†	2.4	0.002668	mg/L	0.0020518	0.002668	mg/L	0.0020518	76.92%
QC value within limits for As 188.979 Recovery = Not calculated								
B 249.677†	1.9	0.002840	mg/L	0.0003774	0.002840	mg/L	0.0003774	13.29%
QC value within limits for B 249.677 Recovery = Not calculated								
Ba 233.527 A†	47.4	0.000421	mg/L	0.0000066	0.000421	mg/L	0.0000066	1.56%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 R†	2.4	0.000057	mg/L	0.0000481	0.000057	mg/L	0.0000481	84.33%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821†	8.8	0.011772	mg/L	0.0011686	0.011772	mg/L	0.0011686	9.93%
QC value within limits for Bi 222.821 Recovery = Not calculated								
Ca 315.887 †	-1.4	-0.000334	mg/L	0.0002543	-0.000334	mg/L	0.0002543	76.26%
QC value within limits for Ca 315.887 Recovery = Not calculated								
Cd 226.502†	0.9	0.000181	mg/L	0.0004084	0.000181	mg/L	0.0004084	225.61%
QC value within limits for Cd 226.502 Recovery = Not calculated								
Ce 418.660†	5.1	0.000143	mg/L	0.0001537	0.000143	mg/L	0.0001537	107.43%
Co 228.616†	3.3	0.000129	mg/L	0.0000057	0.000129	mg/L	0.0000057	4.43%
QC value within limits for Co 228.616 Recovery = Not calculated								
Cr 267.716†	-2.4	-0.000263	mg/L	0.0002524	-0.000263	mg/L	0.0002524	96.09%
QC value within limits for Cr 267.716 Recovery = Not calculated								
Cu 324.752†	937.6	0.003528	mg/L	0.0000055	0.003528	mg/L	0.0000055	0.16%
QC value within limits for Cu 324.752 Recovery = Not calculated								
Fe 273.955 †	7.2	0.006570	mg/L	0.0001793	0.006570	mg/L	0.0001793	2.73%
QC value within limits for Fe 273.955 Recovery = Not calculated								
Ga 417.206†	12.1	0.000184	mg/L	0.0000805	0.000184	mg/L	0.0000805	43.76%
QC value within limits for Ga 417.206 Recovery = Not calculated								
K 766.490 †	12.2	0.005440	mg/L	0.0016986	0.005440	mg/L	0.0016986	31.23%
QC value within limits for K 766.490 Recovery = Not calculated								
La 379.478†	66.3	0.000471	mg/L	0.0001140	0.000471	mg/L	0.0001140	24.22%
QC value within limits for La 379.478 Recovery = Not calculated								
Li 670.784†	-94.4	-0.000982	mg/L	0.0003800	-0.000982	mg/L	0.0003800	38.70%
QC value within limits for Li 670.784 Recovery = Not calculated								
Mg 279.077 †	0.1	0.000332	mg/L	0.0038031	0.000332	mg/L	0.0038031	>999.9%
QC value within limits for Mg 279.077 Recovery = Not calculated								
Mn 260.568†	3.3	0.000218	mg/L	0.0000325	0.000218	mg/L	0.0000325	14.92%
QC value within limits for Mn 260.568 Recovery = Not calculated								
Mo 202.031†	1.2	0.000773	mg/L	0.0001919	0.000773	mg/L	0.0001919	24.84%
QC value within limits for Mo 202.031 Recovery = Not calculated								
Na 589.592†	9.6	0.001848	mg/L	0.0001214	0.001848	mg/L	0.0001214	6.57%
QC value within limits for Na 589.592 Recovery = Not calculated								
Ni 232.003†	3.5	0.000745	mg/L	0.0002519	0.000745	mg/L	0.0002519	33.79%
QC value within limits for Ni 232.003 Recovery = Not calculated								
P 213.617†	0.7	0.001681	mg/L	0.0024940	0.001681	mg/L	0.0024940	148.40%
QC value within limits for P 213.617 Recovery = Not calculated								
Pb 220.353†	0.9	0.001006	mg/L	0.0018431	0.001006	mg/L	0.0018431	183.19%
QC value within limits for Pb 220.353 Recovery = Not calculated								
Sb 206.836†	-2.4	-0.001190	mg/L	0.0003050	-0.001190	mg/L	0.0003050	25.62%
QC value within limits for Sb 206.836 Recovery = Not calculated								
Sc 361.383†	72.4	0.000069	mg/L	0.0000004	0.000069	mg/L	0.0000004	0.64%
QC value within limits for Sc 361.383 Recovery = Not calculated								
Se 196.026†	3.2	0.004295	mg/L	0.0010180	0.004295	mg/L	0.0010180	23.70%
QC value within limits for Se 196.026 Recovery = Not calculated								
Si 251.611†	2.2	0.001315	mg/L	0.0021189	0.001315	mg/L	0.0021189	161.13%
QC value within limits for Si 251.611 Recovery = Not calculated								
SIO2 251.611†	2.2	0.002816	mg/L	0.0045351	0.002816	mg/L	0.0045351	161.06%

QC value within limits for SIO2 251.611 Recovery = Not calculated

Sn 189.927†	0.8	0.001140 mg/L	0.0002407	0.001140 mg/L	0.0002407	21.11%

QC value within limits for Sn 189.927 Recovery = Not calculated

Sr 421.552†	47.6	0.000174 mg/L	0.0000134	0.000174 mg/L	0.0000134	7.71%

QC value within limits for Sr 421.552 Recovery = Not calculated

Ti 336.121†	64.0	0.000165 mg/L	0.0000722	0.000165 mg/L	0.0000722	43.73%

QC value within limits for Ti 336.121 Recovery = Not calculated

Tl 190.801†	2.6	0.002984 mg/L	0.0015691	0.002984 mg/L	0.0015691	52.58%

QC value within limits for Tl 190.801 Recovery = Not calculated

U 385.958†	-38.8	-0.009791 mg/L	0.0027261	-0.009791 mg/L	0.0027261	27.84%
V 292.402†	1.0	0.000058 mg/L	0.0000456	0.000058 mg/L	0.0000456	78.92%

QC value within limits for V 292.402 Recovery = Not calculated

Zn 206.200†	1.4	0.000234 mg/L	0.0000967	0.000234 mg/L	0.0000967	41.25%

QC value within limits for Zn 206.200 Recovery = Not calculated

All analyte(s) passed QC.

SVL ANALYTICAL
One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

ICP Color Sheet

Client: Golder Associates (AZ)

Batch	SDG Number	Case Number
W917163	9D0292	

Matrix: Solid **Prepared using: SOP 4094 (3050B ICP)**

Lab Number	Client ID	pH <2	COLOR Before	COLOR After	CLARITY Before	CLARITY After	TEXTURE	ARTIFACT (Y/N) *	PREP wgt/vol
W917163-BLK1	Blank	NA	NA	Yellow	NA	NA	NA	N	100ml
W917163-BS1	LCS		NA				NA		1.00g/100ml
W917163-MS1	Matrix Spike		Brown				Fine		
W917163-MSD1	MS Dup								
W9D0292-01	NMF-07HHF								
W9D0292-02	NMF-07HHF								
W9D0292-03	EMF-07HHF								
W9D0292-04	EMF-07HHF								
W9D0292-05	EMF-07HHF								
W9D0292-06	EMF-07HHF								
W9D0292-07	EMF-07HHF								
W9D0292-08	EMF-07HHF								
W9D0292-09	EMF-07HHF								
W9D0292-10	EMF-07HHF								
W9D0292-11	EMF-07HHF	↓	↓	↓	↓	↓	↓	↓	↓

04/29/2009

COLOR : red, blue, yellow, green, orange, violet, white, colorless, brown, grey, black
CLARITY : clear, cloudy, opaque
TEXTURE : fine (powdery), medium (sand), coarse (large crystals or rocks)

* If artifacts are found, report "yes" and describe in the space below:

04/29/2009

Heidi Brown

W917163

SVL ANALYTICAL

Log/Preparation Bench Sheet

See Extraction Comments

W917163

98

Matrix: Solid

Prepared using: SOP 4094 (3050B ICP)

Earliest Due: 04/29/09 Earliest Expiration: 09/29/09 08:50

			Origin	Hold Time Expires	Home Location	Client	Due Da
W917163-BLK1	Blank	[1g - 100mL]					
W917163-BS1	LCS	[1g - 100mL]	Spike 1: 09B0104				
W917163-MS1	Matrix Spike [W9D0292-01]	[1g - 100mL]	Spike 1: 09B0104				
W917163-MSD1	MS Dup [W9D0292-01]	[1g - 100mL]	Spike 1: 09B0104				
W9D0292-01	B by T 6010B	As Cu Pb					29-Apr-
ClientSample ID:	NMF-07HHRA-005S1	[1g - 100mL]	Arizona	30-Sep-09 11:15	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-02	B by T 6010B	As Cu Pb					29-Apr-
ClientSample ID:	NMF-07HHRA-005E1	[1g - 100mL]	Arizona	30-Sep-09 11:00	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-03	B by T 6010B	As Cu Pb					29-Apr-
ClientSample ID:	EMF-07HHRA-002N1	[1g - 100mL]	Arizona	29-Sep-09 08:50	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-04	B by T 6010B	As Cu Pb					29-Apr-
ClientSample ID:	EMF-07HHRA-002S1	[1g - 100mL]	Arizona	29-Sep-09 08:55	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-05	B by T 6010B	As Cu Pb					29-Apr-
ClientSample ID:	EMF-07HHRA-004N1	[1g - 100mL]	Arizona	29-Sep-09 10:50	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-06	B by T 6010B	As Cu Pb					29-Apr-
ClientSample ID:	EMF-07HHRA-004W1	[1g - 100mL]	Arizona	29-Sep-09 10:55	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-07	B by T 6010B	As Cu Pb					29-Apr-
ClientSample ID:	EMF-07HHRA-003N1	[1g - 100mL]	Arizona	29-Sep-09 13:20	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-08	B by T 6010B	As Cu Pb					29-Apr-
ClientSample ID:	EMF-07HHRA-003W1	[1g - 100mL]	Arizona	29-Sep-09 13:15	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-09	B by T 6010B	As Cu Pb					29-Apr-
ClientSample ID:	EMF-07HHRA-005N1	[1g - 100mL]	Arizona	29-Sep-09 15:20	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-10	B by T 6010B	As Cu Pb					29-Apr-
ClientSample ID:	EMF-07HHRA-005E1	[1g - 100mL]	Arizona	29-Sep-09 15:45	BoilerRm 07 F	Golder Associates (AZ)	
W9D0292-11	B by T 6010B	As Cu Pb					29-Apr-
ClientSample ID:	EMF-07HHRA-BFD2	[1g - 100mL]	Arizona	30-Sep-09 12:30	BoilerRm 07 F	Golder Associates (AZ)	

level 3

COPY
ORIGINAL IS BENCH SHEET
YB - 04/29/2009

M3-Cu

Preparation Reagents

Standard	Description	Lot Number
09A0190	HNO3, conc.	K1408
09C0150	H2O2, 30%	200833608

Standard	Description	Lot Number
09B0018	1:1 HNO3	K1408
09D0202	HCl, conc.	46257

Spike Standards

Standard	Description	Amount (µL)
09B0104	QC19115ScSn SOIL DIG	1000

Standard	Description	Amount (µL)

Digested By: YB Date/Time: 04/23/09 1035 Instrument ID: ICP Optima ☒1 ☐5 ☐6 ☐7

Analyzed By: DT Date/Time: 4/28/09

Reviewed By: [illegible] Date: 04/29/2009 Data File(s): 09118A

Instrument operating conditions and parameters for this analytical batch are as stated in

99

From: Origin ID: TUSA (520) 888-8818
Administrative Assistant
Golder Associates Inc
4730 North Oracle Rd
Suite 210
Tucson, AZ 85705

FedEx Express

J90110901302023

Ship Date: 14APR09
ActWgt: 62.0 LB
CAD: 7386486/INET9011
Account#: S *********

Delivery Address Bar Code

SHIP TO: (208) 784-1258 BILL SENDER

Kirby Gray
SVL Analytical
One Government Gulch

Kellogg, ID 83837

Ref # 07392519.2
Invoice #
PO #
Dept #

TRK# 0201 7975 0719 5140

WED - 15APR PM
PRIORITY OVERNIGHT

X3 COEA

83837
ID-US
GEG

Cooler 1
5.2°

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic valueof the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

WA0292

100

From: Origin ID: TUSA (520) 888-8818
Administrative Assistant
Golder Associates Inc
4730 North Oracle Rd
Suite 210
Tucson, AZ 85705

FedEx Express

J90110901302023

Ship Date: 14APR09
ActWgt: 54.0 LB
CAD: 7386486/INET9011
Account#: S *********

Delivery Address Bar Code

SHIP TO: (208) 784-1258 BILL SENDER
Kirby Gray
SVL Analytical
One Government Gulch

Kellogg, ID 83837

Ref # 07392519.2
Invoice #
PO #
Dept #

TRK# 0201 7975 0719 3515

WED - 15APR PM
PRIORITY OVERNIGHT

83837
ID-US
GEG

X3 COEA

Cooler 2
3.0°

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic valueof the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

WA00292

CHAIN OF CUSTODY RECORD

SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX: (208) 783-0891

Page 1 of 2

FOR SVL USE ONLY
SVL JOB #
TEMP on Receipt: W9D0292

Table 1. – Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other_____

Report to Company:	GOLDER ASSOCIATES INC.
Contact:	ORESTES MORFIN
Address:	4730 N. ORACLE #210 TUCSON AZ 85705
Phone Number:	520-888-8818
FAX Number:	*8817
E-mail:	omorfin@golder.com
Invoice Sent To:	SAME
Contact:	
Address:	
Phone Number:	
FAX Number:	
PO#:	

RCRA HHRA
Project Name: ANOMALOUS Pb SAMPLING
Sampler's Signature: Orestes Morfin

Indicate State of sample origination: AZ **USACE?** ☐ Yes ☐ No

	Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Misc. Matrix Type (From Table 1)	Misc. No. of Containers	Preservative(s) Unpreserved	HNO_3 Filtered	HNO_3 Unfiltered	HCl	H_2SO_4	NaOH	Other (Specify)	Analyses Required: TOTAL METALS FOR As, Cu + Pb ON < 250 micron FRACTION	Analyses Required: SPLP FOR As, Cu + Pb ON BULK FRACTION	Analyses Required: SEE ATTACHED TABLE 1	Rush Instructions (Days)	Comments
	Please take care to distinguish between: 1 and I, 2 and Z, 5 and S, Ø and O. Thanks!																	
1	NMF-Ø7HHRA-ØØ5S1	4/3/09	1115	OM	3	1							ICE	✓	✓			• STANDARD 20:1 RATIO FOR SPLP • EPA LEVEL III REPORTING • NORMAL T.A.T • SPLIT SAMPLE, + SIEVE 1 SPLIT TO 60Z 250µm FOR TOTAL METALS ANALYSIS
2	-ØØ5E1	"	1100	OM														• DELIVER RESULTS IN E-FORM & PDF TO GOLDER
3	EMF-Ø7HHRA-ØØ2N1	4/2/09	850															
4	-ØØ2S1		855															ARCHIVE REMAINING SAMPLE
5	-ØØ4N1		1050															
6	-ØØ4W1		1055															
7	-ØØ3N1		1320															
8	-ØØ3W1		1315															
9	-ØØ5N1		1520															
10	-ØØ5E1		1545															

COOLER 1 — 5.2°
COOLER 2 — 3.5°

Relinquished by:	Orestes Morfin	Date: 4/14/09	Time: 1600	Received by: R. Strakeleng	Date: 4/15/09 Time: 14:50
Relinquished by:		Date:	Time:	Received by:	Date: Time:

* Sample Reject: ☐ Return ☐ Dispose ☐ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SVL-COC 9/05

102

CHAIN OF CUSTODY RECORD

SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX: (208) 783-0891

FOR SVL USE ONLY
SVL JOB # WA00292
TEMP on Receipt:

Table 1. – Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other_____

Report to Company: GOLDER ASSOCIATES INC
Contact: ORESTES MORFIN
Address: 4730 N. ORACLE #210
TUCSON AZ 85705
Phone Number: 520-888-8818
FAX Number: -8817
E-mail: omorfin@golder.com

Invoice Sent To: SAME
Contact:
Address:
Phone Number:
FAX Number:
PO#:

Project Name: RCML HHRA ANOMALOUS Pb SAMPLIN
Sampler's Signature: Orestes Morfin

Indicate State of sample origination: AZ **USACE?** ☐ Yes ☐ No

	Sample ID (Please take care to distinguish between: 1 and I, 2 and Z, 5 and S, Ø and O. Thanks!)	Collection: Date	Collection: Time	Collected by: (Init.)	Misc.: Matrix Type (From Table 1)	Misc.: No. of Containers	Preservative(s): Unpreserved	HNO_3 Filtered	HNO_3 Unfiltered	HCl	H_2SO_4	NaOH	Other (Specify) ICE	Analyses Required: TOTAL METALS FOR As, Cu + Pb ON <250µm FRACTION	SPLP FOR As, Cu + Pb ON BULK FRACTION	AQUEOUS ANALYSIS FOR Cu + As + Pb	SEE ATTACHED TABLE 1	Rush Instructions (Days)
1	EMF-ØTHHRA-BFD2	4/3/09	12³⁰	OM	3	1							✓	✓			
2	SIEVE DRB	"	17⁰⁰	OM	4	1			✓						✓		
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Comments
- STANDARD 20:1 RATIO FOR SPLP
- EPA LEVEL III REPORTING
- NORMAL T.A.T
- SPLIT SAMPLE 1 + SIEVE 1 SPLIT TO <250µm FOR TOTAL METALS ANALYSIS
- DELIVER RESULTS IN E-FORM & PDF TO GOLDER

		Date	Time		
Relinquished by:	Orestes Morfin	4/14/09	16⁰⁰	Received by:	R. Strebling
Relinquished by:		Date:	Time:	Received by:	

		Date	Time
		4/15/09	11:50
		Date:	Time:

* Sample Reject: ☐ Return ☐ Dispose ☐ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SVL-COC 9/05

Table 1
Tier 2 Analytical Suite for RCML HHRA Solid Samples and Decontamination Rinseate Blanks

103

W9D0292

Constituent	Arizona Residential SRL (mg/kg)	Arizona Non-residential SRL (mg/kg)	Minimum GPL (mg/kg)	AWQS (mg/L)	Total Metals Analysis (<250 µm fraction)		Aqueous* Analysis	
					Analytical Method	PQL (mg/kg)	Analytical Method	PQL (mg/L)
Arsenic	10	10	290	0.05	EPA 6010 ICP	2.5	EPA 6020 ICP-MS	0.003
Copper	3,100	41,000	NS	NS	EPA 6010 ICP	1.0	EPA 6010 ICP	0.01
Lead	400	800	290	0.05	EPA 6010 ICP	0.75	EPA 6010 ICP	0.0075

Notes:
SRL = soil remediation level
GPL = groundwater protection level
AWQS = aquifer water quality standard
*Includes synthetic precipitation leaching procedure and decontamination rinseate blanks (DRBs)
PQL = practical quantitation limit
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
EPA = US Environmental Protection Agency
NS = no standard

SAMPLE LOG-IN SHEET

104

Lab Name: SVL ANALYTICAL

Page 1 of 1

Received By (Print Name): R. STRIBLING

Log-in Date: 04/15/2009

Received By (Signature): R. Stribling CAS

Case Number:

Sample Delivery Group No.:

NRAS Number: NA

Remarks:

1. Custody Seal(s): Present/~~Absent~~* Intact/Broken
2. Custody Seal Nos.: NA
3. Traffic ~~Reports~~/Chain of Custody Records or Packing Lists: Present/~~Absent~~*
4. Airbill: ~~Airbill~~/Sticker Present/~~Absent~~*
5. Airbill No.: 797567195140, 797567193515
6. Sample Tags: Present/~~Absent~~*
   Sample Tag Numbers: ~~Listed~~/Not Listed on Chain of ~~Custody Record~~
7. Sample Condition: Intact/~~Broken~~*/Leaking
8. Cooler Temperature Indicator Bottle: Present/~~Absent~~*
9. Cooler Temperature: 5.2/3.2°C
10. Does information on Chain of Custody Records and sample tags agree?: Yes/~~No~~*
11. Date Received at Lab: 04/15/2009
12. Time Received: ____

EPA Sample #	Aqueous Sample pH	Corresponding Sample Tag #	Corresponding Assigned Lab #	Remarks: Condition of Sample Shipment, etc.
NMF-07HHRA-00551			NMF-07HHRA-00551	INTACT
NMF-07HHRA-00SE1			NMF-07HHRA-00SE1	
EMF-07HHRA-002N1			EMF-07HHRA-002N1	
EMF-07HHRA-00251			EMF-07HHRA-00251	
EMF-07HHRA-004N1			EMF-07HHRA-004N1	
EMF-07HHRA-004W1			EMF-07HHRA-004W1	
EMF-07HHRA-003N1			EMF-07HHRA-003N1	
EMF-07HHRA-003W1			EMF-07HHRA-003W1	
EMF-07HHRA-00SN1			EMF-07HHRA-00SN1	
EMF-07HHRA-00SE1			EMF-07HHRA-00SE1	
EMF-07HHRA-BFD2		04/15/2009	EMF-07HHRA-BFD2	
				04/15/2009 CAS

Sample Transfer

raction	N/A	Fraction	N/A
rea #	N/A	Area #	N/A
y	N/A	By	N/A
n	N/A	On	N/A

Contact SMO and attach record of resolution

eviewed By: Kirby Lucas

ate: 04/15/2009

N/A | Logbook No. N/A

N/A | Logbook Page No. N/A

FORM DC-1

Contract Laboratory Program

Sample Delivery Group (SDG) Cover Sheet

SDG Number: 9D0292

☐ ICP-AES Analysis

☐ ICP-MS Analysis

Laboratory Name: SVL ANALYTICAL

Laboratory Code: _____

Contract No.: _____

Case No.: _____

Analysis Price: _____

SDG Turnaround: _____

Modified Analysis (if applicable):

Modification Reference No.: _____

USEPA Sample Numbers in SDG (Listed in Numerical Order)

1) NMF-07HHRA-00551	7) EMF-07HHRA-003N1	13)	19)
2) NMF-07HHRA-005E1	8) EMF-07HHRA-003W1	14)	20)
3) EMF-07HHRA-002N1	9) EMF-07HHRA-005N1	15)	21)
4) EMF-07HHRA-00251	10) EMF-07HHRA-005E1	16)	22)
5) EMF-07HHRA-004N1	11) EMF-07HHRA-BFD2	17)	23)
6) EMF-07HHRA-004W1	12)	18)	24)

NMF-07HHRA-00551

First Sample in SDG

EMF-07HHRA-BFD2

Last Sample in SDG

04/15/2009

First Sample Receipt Date

04/15/2009

Last Sample Receipt Date

Note: *There are a maximum of 20 field samples (excluding PE samples) in an SDG. Attach the TR/COC Records to this form in alphanumeric order (the order listed above on this form).*

Signature: _____ Date: 04/15/2009

SAMPLE RECEIPT/CHAIN-OF -CUSTODY CHECKLIST

The following items were checked for completeness, correctness, and compliance to project specifications using the Chain-of-Custody (COC) and other supporting information.

Date of acceptance: 04/15/2009 **By:** CP Seay

SVL Work No: W9D0292

Item	Description	V	VC	NV	NA	Comments
1	Client or project name	✓				Golder
2	Date and time of receipt at lab	✓				4/15/09 12:50
3	Received by	✓				ROBIN STRIBLING
4	Temperature blank or cooler temperature	✓				Temp. 5.2° °C., 3.2° Two coolers
5	Were the sample(s) received on ice	✓				yes
6	Custody tape/bottle seals	✓				NO
7	Condition of samples upon receipt (leaking; bubbles in VOA vials	✓				GOOD
8	Sample numbers/IDs agree with COC	✓				
9	Sample date & time agree with COC	✓				
10	Number of containers for each sample	✓				
11	The correct preservative for the analysis requested	✓				HNO3 bottle checked and <2
12	Did an SVL employee preserve sample(s) upon receipt				✓	
12	Type of container for each sample / volume received	✓				
13	Analysis requested for each sample	✓				
14	Sample matrix description	✓				
15	COC properly completed & legible	✓				
16	Corrections properly made (initials & date)				✓	
17	Additional comments or records of sample condition or treatment (unlisted or missing samples at laboratory, aliquot taken, sample hold, samples subcontracted, communications between client and laboratory)				✓	
18	Shipper's air bill	✓				

V- Verified VC- Verified Corrections Made NV-Not Verified NA- Not Applicable

Additional Comments: _____

Analytical Run Log
ICP-OES

Data File: 09118A

Sample ID	Date	Time	Job Number	Instrument	Analyst
Calib Blank 1	4/28/2009	8:14:57 AM			DT
STD1	4/28/2009	8:20:57 AM			DT
STD2	4/28/2009	8:26:44 AM			DT
STD3	4/28/2009	8:31:52 AM			DT
STD4	4/28/2009	8:36:00 AM			DT
STD5	4/28/2009	8:40:02 AM			DT
ICV	4/28/2009	8:44:01 AM			DT
ICV	4/28/2009	8:54:36 AM			DT
ICB	4/28/2009	9:00:25 AM			DT
CRI	4/28/2009	9:06:02 AM			DT
ICSA	4/28/2009	9:11:42 AM			DT
ICSAB	4/28/2009	9:18:15 AM			DT
CCV	4/28/2009	9:24:45 AM			DT
CCB	4/28/2009	9:30:44 AM			DT
W917163-BLK1	4/28/2009	10:02:02 AM			DT
W917163-BS1	4/28/2009	10:07:42 AM			DT
W9D0292-01	4/28/2009	10:13:26 AM	W917163	OPT1	DT
W917163-MS1	4/28/2009	10:24:25 AM	W917163	OPT1	DT
W917163-MSD1	4/28/2009	10:31:12 AM	W917163	OPT1	DT
W9D0292-02	4/28/2009	10:37:34 AM	W917163	OPT1	DT
W9D0292-03	4/28/2009	10:44:16 AM	W917163	OPT1	DT
W9D0292-04	4/28/2009	10:50:31 AM	W917163	OPT1	DT
W9D0292-05	4/28/2009	10:56:37 AM	W917163	OPT1	DT
W9D0292-04@20X	4/28/2009	11:03:26 AM	W917163	OPT1	DT
CCV	4/28/2009	11:09:10 AM			DT
CCB	4/28/2009	11:15:39 AM			DT
W9D0292-06	4/28/2009	11:21:36 AM	W917163	OPT1	DT
W9D0292-07	4/28/2009	11:28:48 AM	W917163	OPT1	DT
W9D0292-08	4/28/2009	11:35:14 AM	W917163	OPT1	DT
W9D0292-09	4/28/2009	11:41:40 AM	W917163	OPT1	DT
W9D0292-10	4/28/2009	11:48:18 AM	W917163	OPT1	DT
W9D0292-11	4/28/2009	11:55:17 AM	W917163	OPT1	DT
ZZZZZZ	4/28/2009	12:01:25 PM	W917163	OPT1	DT
CCV	4/28/2009	12:07:20 PM			DT
CCB	4/28/2009	12:13:39 PM			DT

SVL ANALYTICAL

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

108

Sample Receipt Confirmation

Work Order
W9D0292

Date Due: 29-Apr-09 (10 day TAT)
Received: 15-Apr-09 14:50

Client: **Golder Associates (AZ)**
Project: **HHRA (L3)**

Project Manager: **Christine Meyer**

Report To:
Golder Associates (AZ)
Orestes Morfin
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705
Phone: 520-888-8818
Fax: 520-888-8817

Invoice To:
Golder Associates (AZ)
Orestes Morfin
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705
Phone: 520-888-8818
Fax: 520-888-8817

Cooler information for **1** Temp: 5.2°C Q6: Cooler temp outside 0-6° **No**
Custody Seals **No** Containers Intact **Yes** COC/Labels Agree **Yes** Preservation Confirmed **No** Received On Ice **Yes**

Cooler information for **2** Temp: 3.2°C Q6: Cooler temp outside 0-6° **No**
Custody Seals **No** Containers Intact **Yes** COC/Labels Agree **Yes** Preservation Confirmed **Yes** Received On Ice **Yes**

Container Comments

W9D0292-01	A	Bag, Ziploc	ARCHIVE
W9D0292-01	B	Envelope, manilla	ARCHIVE
W9D0292-02	A	Bag, Ziploc	ARCHIVE
W9D0292-02	B	Envelope, manilla	ARCHIVE
W9D0292-03	A	Bag, Ziploc	ARCHIVE
W9D0292-03	B	Envelope, manilla	ARCHIVE
W9D0292-04	A	Bag, Ziploc	ARCHIVE
W9D0292-04	B	Envelope, manilla	ARCHIVE
W9D0292-05	A	Bag, Ziploc	ARCHIVE
W9D0292-05	B	Envelope, manilla	ARCHIVE
W9D0292-06	A	Bag, Ziploc	ARCHIVE
W9D0292-06	B	Envelope, manilla	ARCHIVE
W9D0292-07	A	Bag, Ziploc	ARCHIVE
W9D0292-07	B	Envelope, manilla	ARCHIVE
W9D0292-08	A	Bag, Ziploc	ARCHIVE
W9D0292-08	B	Envelope, manilla	ARCHIVE
W9D0292-09	A	Bag, Ziploc	ARCHIVE
W9D0292-09	B	Envelope, manilla	ARCHIVE
W9D0292-10	A	Bag, Ziploc	ARCHIVE
W9D0292-10	B	Envelope, manilla	ARCHIVE
W9D0292-11	A	Bag, Ziploc	ARCHIVE
W9D0292-11	B	Envelope, manilla	ARCHIVE

Sample information and analyses assigned	Comments	Removed Analyte
W9D0292-01 **NMF-07HHRA-005S1 [Soil] 03-Apr-09 11:15 Pacific** Golder - HHRA Soil (Level 3)		
W9D0292-02 **NMF-07HHRA-005E1 [Soil] 03-Apr-09 11:00 Pacific** Golder - HHRA Soil (Level 3)		
W9D0292-03 **EMF-07HHRA-002N1 [Soil] 02-Apr-09 08:50 Pacific** Golder - HHRA Soil (Level 3)		
W9D0292-04 **EMF-07HHRA-002S1 [Soil] 02-Apr-09 08:55 Pacific** Golder - HHRA Soil (Level 3)		
W9D0292-05 **EMF-07HHRA-004N1 [Soil] 02-Apr-09 10:50 Pacific** Golder - HHRA Soil (Level 3)		
W9D0292-06 **EMF-07HHRA-004W1 [Soil] 02-Apr-09 10:55 Pacific** Golder - HHRA Soil (Level 3)		

Samples will be disposed 30 days from report date (45 for soils). Longer archiving must be requested.
Please contact Crystal Sevy (208-784-1258) if you have questions regarding the receipt of these samples.

Printed: 4/15/2009 04:47 PM

SVL ANALYTICAL
One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Sample Receipt Confirmation

Work Order
W9D0292

Date Due: 29-Apr-09 (10 day TAT)
Received: 15-Apr-09 14:50

Client: **Golder Associates (AZ)**
Project: **HHRA (L3)**

Project Manager: **Christine Meyer**

Report To:
Golder Associates (AZ)
Orestes Morfin
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705
Phone: 520-888-8818
Fax: 520-888-8817

Invoice To:
Golder Associates (AZ)
Orestes Morfin
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705
Phone: 520-888-8818
Fax: 520-888-8817

Cooler information for **1** Temp: 5.2°C Q6: Cooler temp outside 0-6° **No**
Custody Seals **No** Containers Intact **Yes** COC/Labels Agree **Yes** Preservation Confirmed **No** Received On Ice **Yes**

Cooler information for **2** Temp: 3.2°C Q6: Cooler temp outside 0-6° **No**
Custody Seals **No** Containers Intact **Yes** COC/Labels Agree **Yes** Preservation Confirmed **Yes** Received On Ice **Yes**

Container Comments

W9D0292-01	A	Bag, Ziploc	ARCHIVE
W9D0292-01	B	Envelope, manilla	ARCHIVE
W9D0292-02	A	Bag, Ziploc	ARCHIVE
W9D0292-02	B	Envelope, manilla	ARCHIVE
W9D0292-03	A	Bag, Ziploc	ARCHIVE
W9D0292-03	B	Envelope, manilla	ARCHIVE
W9D0292-04	A	Bag, Ziploc	ARCHIVE
W9D0292-04	B	Envelope, manilla	ARCHIVE
W9D0292-05	A	Bag, Ziploc	ARCHIVE
W9D0292-05	B	Envelope, manilla	ARCHIVE
W9D0292-06	A	Bag, Ziploc	ARCHIVE
W9D0292-06	B	Envelope, manilla	ARCHIVE
W9D0292-07	A	Bag, Ziploc	ARCHIVE
W9D0292-07	B	Envelope, manilla	ARCHIVE
W9D0292-08	A	Bag, Ziploc	ARCHIVE
W9D0292-08	B	Envelope, manilla	ARCHIVE
W9D0292-09	A	Bag, Ziploc	ARCHIVE
W9D0292-09	B	Envelope, manilla	ARCHIVE
W9D0292-10	A	Bag, Ziploc	ARCHIVE
W9D0292-10	B	Envelope, manilla	ARCHIVE
W9D0292-11	A	Bag, Ziploc	ARCHIVE
W9D0292-11	B	Envelope, manilla	ARCHIVE

Sample information and analyses assigned	Comments	Removed Analyte
W9D0292-07 **EMF-07HHRA-003N1 [Soil] 02-Apr-09 13:20 Pacific** Golder - HHRA Soil (Level 3)		
W9D0292-08 **EMF-07HHRA-003W1 [Soil] 02-Apr-09 13:15 Pacific** Golder - HHRA Soil (Level 3)		
W9D0292-09 **EMF-07HHRA-005N1 [Soil] 02-Apr-09 15:20 Pacific** Golder - HHRA Soil (Level 3)		
W9D0292-10 **EMF-07HHRA-005E1 [Soil] 02-Apr-09 15:45 Pacific** Golder - HHRA Soil (Level 3)		
W9D0292-11 **EMF-07HHRA-BFD2 [Soil] 03-Apr-09 12:30 Pacific** Golder - HHRA Soil (Level 3)		

Samples will be disposed 30 days from report date (45 for soils). Longer archiving must be requested.
Please contact Crystal Sevy (208-784-1258) if you have questions regarding the receipt of these samples.

Printed: 4/15/2009 04:47 PM

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Sample Receipt Confirmation

Work Order
W9D0292

Date Due: 29-Apr-09 (10 day TAT)
Received: 15-Apr-09 14:50

Client: **Golder Associates (AZ)**
Project: **HHRA (L3)**

Project Manager: **Christine Meyer**

Analysis groups included in this work order

Golder - HHRA Soil (Level 3)

Sieve #60	T 6010B As	T 6010B Cu	T 6010B Pb

Solid samples will be analyzed on an as-received, wet-weight basis unless otherwise instructed.
Work Order Comments:

Reviewed By

04/15/2009
Date

Samples will be disposed 30 days from report date (45 for soils). Longer archiving must be requested.
Please contact Crystal Sevy (208-784-1258) if you have questions regarding the receipt of these samples.

Printed: 4/15/2009 04:47 PM

SVL ANALYTICAL
One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Sample Receipt Confirmation

Work Order
W9D0292

Date Due: 29-Apr-09 (10 day TAT)
Received: 15-Apr-09 14:50

Client: **Golder Associates (AZ)**
Project: **HHRA (L3)**

Project Manager: **Christine Meyer**

	W9D0292-01 NMF-07HHR A-005S1 Solid	W9D0292-02 NMF-07HHR A-005E1 Solid	W9D0292-03 EMF-07HHR A-002N1 Solid	W9D0292-04 EMF-07HHR A-002S1 Solid	W9D0292-05 EMF-07HHR A-004N1 Solid	W9D0292-06 EMF-07HHR A-004W1 Solid	W9D0292-07 EMF-07HHR A-003N1 Solid	W9D0292-08 EMF-07HHR A-003W1 Solid
Sieve #60	X	X	X	X	X	X	X	X
T 6010B As	X	X	X	X	X	X	X	X
T 6010B Cu	X	X	X	X	X	X	X	X
T 6010B Pb	X	X	X	X	X	X	X	X

	W9D0292-09 EMF-07HHR A-005N1 Solid	W9D0292-10 EMF-07HHR A-005E1 Solid	W9D0292-11 EMF-07HHR A-BFD2 Solid
Sieve #60	X	X	X
T 6010B As	X	X	X
T 6010B Cu	X	X	X
T 6010B Pb	X	X	X

Samples will be disposed 30 days from report date (45 for soils). Longer archiving must be requested.
Please contact Crystal Sevy (208-784-1258) if you have questions regarding the receipt of these samples.

Printed: 4/15/2009 04:47 PM

GOLDER ASSOCIATES

PROJECT NAME: RCML HHRA ANOMALOUS Pb SAMPLING

SVL/SDG: W9D0297

SDG: W9D0297

NARRATIVE

GOLDER

Project Name: RCML HHRA ANOMALOUS Pb SAMPLING

SVL/SDG: W9D0297

Samples were received April 15, 2009.
Cooler temperatures were 5.2°C and 3.2°C

Samples were prepared as instructions indicated.

Analyzed for arsenic, copper and lead.

"D" Flag indicates dilution was required.

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W9D0297 **Method Type:** _____ **SOW No.:** _____

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Lab Sample ID	Client Sample ID	QC Description
W917018-MS1	NMF-07HHRA-005S1S	Matrix Spike
W917018-MSD1	NMF-07HHRA-005S1SD	Matrix Spike Duplicate
W917039-MS1	NMF-07HHRA-005S1S	Matrix Spike
W917039-MSD1	NMF-07HHRA-005S1SD	Matrix Spike Duplicate
W9D0297-01	NMF-07HHRA-005S1	
W9D0297-02	NMF-07HHRA-005E1	
W9D0297-03	EMF-07HHRA-002N1	
W9D0297-04	EMF-07HHRA-002S1	
W9D0297-05	EMF-07HHRA-004N1	
W9D0297-06	EMF-07HHRA-004W1	
W9D0297-07	EMF-07HHRA-003N1	
W9D0297-08	EMF-07HHRA-003W1	
W9D0297-09	EMF-07HHRA-005N1	
W9D0297-10	EMF-07HHRA-005E1	

Were ICP interelement corrections applied? Yes/No Yes _____

Were ICP background corrections applied? Yes/No Yes _____

If yes - were raw data generated before applications of background corrections? Yes/No No _____

Comments: RCML HHRA ANOMALOUS Pb SAMPLING

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Kirby L. Gray Name: **KIRBY L. GRAY**

Date: 04/29/2009 Title: **TECHNICAL DIRECTOR**

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W9D0297 **Method Type:** **SOW No.:**

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W9D0297-11	EMF-07HHRA-BFD2	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: RCML HHRA ANOMALOUS Pb SAMPLING

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Kirby L. Gray Name: **KIRBY L. GRAY**

Date: 04/29/2009 Title: **TECHNICAL DIRECTOR**

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297 **Method Type:**

Sample ID: W9D0297-03 **Client ID:** EMF-07HHRA-002N1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Date Received:** 04/15/2009 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	95.8	ug/L		D	MS	1.2	PE ICPMS DRC-E	118D
7440-50-8	Copper	326	ug/L			P	3.9	OPTIMA5	w917039
7439-92-1	Lead	31.8	ug/L			P	3.9	OPTIMA5	w917039

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297 **Method Type:**

Sample ID: W9D0297-04 **Client ID:** EMF-07HHRA-002S1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Date Received:** 04/15/2009 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	120	ug/L		D	MS	1.2	PE ICPMS DRC-E	118D
7440-50-8	Copper	310	ug/L			P	3.9	OPTIMA5	w917039
7439-92-1	Lead	22.5	ug/L			P	3.9	OPTIMA5	w917039

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297 **Method Type:**

Sample ID: W9D0297-07 **Client ID:** EMF-07HHRA-003N1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Date Received:** 04/15/2009 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	162	ug/L		D	MS	1.2	PE ICPMS DRC-E	118D
7440-50-8	Copper	349	ug/L			P	3.9	OPTIMA5	w917039
7439-92-1	Lead	56.3	ug/L			P	3.9	OPTIMA5	w917039

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297 **Method Type:**

Sample ID: W9D0297-08 **Client ID:** EMF-07HHRA-003W1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Date Received:** 04/15/2009 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	218	ug/L		D	MS	1.2	PE ICPMS DRC-E	118D
7440-50-8	Copper	515	ug/L			P	3.9	OPTIMA5	w917039
7439-92-1	Lead	86.2	ug/L			P	3.9	OPTIMA5	w917039

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297 **Method Type:**

Sample ID: W9D0297-05 **Client ID:** EMF-07HHRA-004N1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Date Received:** 04/15/2009 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	149	ug/L		D	MS	1.2	PE ICPMS DRC-E	118D
7440-50-8	Copper	292	ug/L			P	3.9	OPTIMA5	w917039
7439-92-1	Lead	28.1	ug/L			P	3.9	OPTIMA5	w917039

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297 **Method Type:**

Sample ID: W9D0297-06 **Client ID:** EMF-07HHRA-004W1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Date Received:** 04/15/2009 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	160	ug/L		D	MS	1.2	PE ICPMS DRC-E	118D
7440-50-8	Copper	402	ug/L			P	3.9	OPTIMA5	w917039
7439-92-1	Lead	31.0	ug/L			P	3.9	OPTIMA5	w917039

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297 **Method Type:**

Sample ID: W9D0297-10 **Client ID:** EMF-07HHRA-005E1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Date Received:** 04/15/2009 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	86.9	ug/L		D	MS	1.2	PE ICPMS DRC-E	118D
7440-50-8	Copper	591	ug/L			P	3.9	OPTIMA5	w917039
7439-92-1	Lead	82.9	ug/L			P	3.9	OPTIMA5	w917039

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297 **Method Type:**

Sample ID: W9D0297-09 **Client ID:** EMF-07HHRA-005N1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Date Received:** 04/15/2009 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	660	ug/L		D	MS	1.2	PE ICPMS DRC-E	118D
7440-50-8	Copper	273	ug/L			P	3.9	OPTIMA5	w917039
7439-92-1	Lead	54.4	ug/L			P	3.9	OPTIMA5	w917039

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297 **Method Type:**

Sample ID: W9D0297-11 **Client ID:** EMF-07HHRA-BFD2

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Date Received:** 04/15/2009 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	106	ug/L		D	MS	1.2	PE ICPMS DRC-E	118D
7440-50-8	Copper	341	ug/L			P	3.9	OPTIMA5	w917039
7439-92-1	Lead	85.2	ug/L			P	3.9	OPTIMA5	w917039

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297 **Method Type:**

Sample ID: W9D0297-02 **Client ID:** NMF-07HHRA-005E1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Date Received:** 04/15/2009 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	64.9	ug/L		D	MS	1.2	PE ICPMS DRC-E	118D
7440-50-8	Copper	124	ug/L			P	3.9	OPTIMA5	w917039
7439-92-1	Lead	32.7	ug/L			P	3.9	OPTIMA5	w917039

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297 **Method Type:**

Sample ID: W9D0297-01 **Client ID:** NMF-07HHRA-005S1

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Date Received:** 04/15/2009 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	39.2	ug/L		D	MS	1.2	PE ICPMS DRC-E	118D
7440-50-8	Copper	63.8	ug/L			P	3.9	OPTIMA5	w917039
7439-92-1	Lead	24.5	ug/L			P	3.9	OPTIMA5	w917039

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Initial Calibration Source: 09C0298 / 09D0346 KG 4/24/09

Continuing Calibration Source: 09C0299 / 09D0346 KG 4/24/09

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV	Arsenic	24.72	25.0	99	90.0 - 110.0	MS	04/28/2009	09:54	118D
CCV	Arsenic	49.49	50.0	99	90.0 - 110.0	MS	04/28/2009	10:03	118D
CCV	Arsenic	50.60	50.0	101	90.0 - 110.0	MS	04/28/2009	10:26	118D
CCV	Arsenic	49.84	50.0	100	90.0 - 110.0	MS	04/28/2009	10:41	118D
ICV	Copper	2009.92	2000.0	100	90.0 - 110.0	P	04/27/2009	07:47	w917039
	Lead	2052.52	2000.0	103	90.0 - 110.0	P	04/27/2009	07:47	w917039
CCV	Copper	2003.35	2000.0	100	90.0 - 110.0	P	04/27/2009	08:17	w917039
	Lead	2036.69	2000.0	102	90.0 - 110.0	P	04/27/2009	08:17	w917039
CCV	Copper	1976.80	2000.0	99	90.0 - 110.0	P	04/27/2009	09:38	w917039
	Lead	2019.51	2000.0	101	90.0 - 110.0	P	04/27/2009	09:38	w917039
CCV	Copper	2002.67	2000.0	100	90.0 - 110.0	P	04/27/2009	11:03	w917039
	Lead	2009.07	2000.0	100	90.0 - 110.0	P	04/27/2009	11:03	w917039
CCV	Copper	1991.49	2000.0	100	90.0 - 110.0	P	04/27/2009	11:21	w917039
	Lead	2011.81	2000.0	101	90.0 - 110.0	P	04/27/2009	11:21	w917039

- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Initial Calibration Source: 09D0346

Continuing Calibration Source: 09D0346

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV									
	Copper	1995.85	2000.0	100	90.0 - 110.0	P	04/27/2009	12:43	w917039
	Lead	2010.14	2000.0	101	90.0 - 110.0	P	04/27/2009	12:43	w917039
CCV									
	Copper	1977.56	2000.0	99	90.0 - 110.0	P	04/27/2009	13:24	w917039
	Lead	1998.15	2000.0	100	90.0 - 110.0	P	04/27/2009	13:24	w917039

- 2b -
CRDL STANDARD FOR AA & ICP

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

AA CRDL Standard Source:

ICP CRDL Standard Source: 09C0299 / 09D0182 KG 4/29/09

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Advisory Limits (%R)	M	Analysis Date	Analysis Time	Run Number
RLCS									
	Arsenic	1.36	1.0	136	50 - 150	MS	04/28/200	09:57	118D
CRI									
	Copper	9.20	10.0	92	50 - 150	P	04/27/200	07:59	w917039
	Lead	7.32	7.5	98	50 - 150	P	04/27/200	07:59	w917039

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB	Arsenic	0.500	+/-1.200	U	0.500	1.200	MS	04/28/2005	09:56	118D
CCB	Arsenic	0.522	+/-1.200	B	0.500	1.200	MS	04/28/2005	10:05	118D
CCB	Arsenic	0.500	+/-1.200	U	0.500	1.200	MS	04/28/2005	10:28	118D
CCB	Arsenic	0.500	+/-1.200	U	0.500	1.200	MS	04/28/2005	10:43	118D
ICB	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/27/2005	07:53	w917039
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/27/2005	07:53	w917039
CCB	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/27/2005	08:23	w917039
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/27/2005	08:23	w917039
CCB	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/27/2005	09:44	w917039
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/27/2005	09:44	w917039
CCB	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/27/2005	11:09	w917039
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/27/2005	11:09	w917039
CCB	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/27/2005	11:27	w917039
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/27/2005	11:27	w917039

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/27/2009	12:49	w917039
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/27/2009	12:49	w917039
CCB										
	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/27/2009	13:30	w917039
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/27/2009	13:30	w917039

- 3b -
PREPARATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result (ug/L)	Conc Qual	Q	Acceptance Limit	MDL	PQL	M	Analysis Date	Analysis Time	Run
W917018-BLK1			SPLP								
	Arsenic	1.250U			+/-1.250	1.250	3.000	MS	04/28/2005	10:07	118D
W917039-BLK1			SPLP								
	Copper	3.900U			+/-3.900	3.900	10.000	P	04/27/2005	11:46	w917039
	Lead	3.900U			+/-3.900	3.900	7.500	P	04/27/2005	11:46	w917039

22

- 4 -

INTERFERENCE CHECK SAMPLE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

ICS Source: 08K0009/08K0010 **Instrument ID:** PE ICPMS DRC-E

09D0295/09D0296 OPTIMA5

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window	Analysis Date	Analysis Time	Run Number
ICSA								
	Arsenic	0.29				04/28/2009	09:59	118D
ICSAB								
	Arsenic	10.7	10.000	107	80 - 120%	04/28/2009	10:01	118D
ICSA								
	Copper	11100	10000	111	80 - 120%	04/27/2009	08:04	w917039
	Lead	7.9				04/27/2009	08:04	w917039
ICSAB								
	Copper	561	500	112	80 - 120%	04/27/2009	08:11	w917039
	Lead	471	500	94	80 - 120%	04/27/2009	08:11	w917039

- 5a -

MATRIX SPIKE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Sample ID:** W9D0297-01 **Client ID:** NMF-07HHRA-005S1S

Percent Solids for Sample: 0.00 **Spiked ID:** W917018-MS1 **Percent Solids for Spike Sample:** 0.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	ug/L	70 - 130	57.2620		39.1613		25.00	72		MS
Copper	ug/L	75 - 125	1095.6130		63.7625		1000.00	103		P
Lead	ug/L	75 - 125	990.7126		24.5373		1000.00	97		P

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Sample ID:** W9D0297-01 **Client ID:** NMF-07HHRA-005S1SD

Percent Solids for Sample: 0.00 **Spiked ID:** W917018-MSD1 **Percent Solids for Spike Sample:** 0.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	ug/L	70 - 130	64.3165		39.1613		25.00	101		MS
Copper	ug/L	75 - 125	1093.2210		63.7625		1000.00	103		P
Lead	ug/L	75 - 125	1001.2480		24.5373		1000.00	98		P

25

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: SPLP **Sample ID:** W917018-MS1 **Client ID:** NMF-07HHRA-005S1SD

Percent Solids for Sample: 0.00 **Duplicate ID:** W917018-MSD1 **Percent Solids for Duplicate:** 0.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	ug/L		57.2620		64.3165		12		MS
Copper	ug/L		1095.6128		1093.2210		0		P
Lead	ug/L		990.7126		1001.2480		1		P

26

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Aqueous LCS Source: 09D0031 **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
W917018-BS1								
	Arsenic	ug/L	25.0	23.94		96	85.0 - 115.0	MS

27

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Aqueous LCS Source: QC19115SCSN **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
W917039-BS1								
	Copper	ug/L	1000.0	1026.87		103	80.0 - 120.0	P
	Lead	ug/L	1000.0	979.97		98	80.0 - 120.0	P

SERIAL DILUTION SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Level:** LOW **Client ID:** NMF-07HHRA-005S1L

Sample ID: W9D0297-01 **Serial Dilution ID:** W917018L1

Analyte	Initial Result ug/L	C	Serial Result ug/L	C	% Difference	Qual	Acceptance Limits	M
Arsenic	15.66		25.15		61		10.00 %	MS

- 10 -
METHOD DETECTION LIMITS

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Analyte	Wave- length (nm)	MDL ug/L	PQL ug/L
OPTIMA5			**Date:** 08/08/2008
Copper	324.752	3.9	10
Lead	220.353	3.9	7.5
PE ICPMS DRC-E			**Date:** 03/24/2009
Arsenic	75	0.50	1.2

30

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0297

Contract: _____ Lab Code: SVL Case No.: _____ SAS No.: _____

Instrument ID: OPTIMA5 Date: 04/14/2009

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	As
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0311155	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0082562	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	-0.0041479	0.0024004	0.2642040	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0060700	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0907537	0.0000000
Lead	220.35	-0.0485288	-0.0056354	0.0664300	0.0086608	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0629024	0.0317489	0.0000000
Nickel	232.00	0.0000000	0.0000000	-0.9716020	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	-0.0496742	0.0000000	-0.1254390	0.1413900	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.0428610	0.0000000	2.2539101
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	-0.0573398	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0662573	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0297

Contract: _____ Lab Code: SVL Case No.: _____ SAS No.: _____

Instrument ID: OPTIMA5 Date: 04/14/2009

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: B	Ba	Be	Cd	Co
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	-1.8380800
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.1558900	0.3000770	0.1114270	-0.4462180
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.2210110
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.2946970	0.1132240	0.2927010	0.0893687	-0.3558450
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.5883340
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.1340070	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.8310990
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	1.5621200	0.0000000	0.0000000	0.7917230	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0297

Contract: _____ Lab Code: SVL Case No.: _____ SAS No.: _____

Instrument ID: OPTIMA5 Date: 04/14/2009

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Cr	Cu	K	Mn	Mo
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	14.3329000
Antimony	206.84	8.8853302	0.0000000	0.0000000	0.0000000	-4.9526401
Arsenic	188.98	1.0321100	0.0863240	0.0000000	-0.0703946	2.3301699
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	-0.0911413	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	-0.0873337
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0703180	0.0000000	0.0610660	-0.1653750
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.1324430	0.2838260
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.9350730	0.0078810	0.2726180	-1.4141400
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	31.1886997	-0.5410850	0.0000000	-2.0494599	3.7165899
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.7399680	0.0000000
Silver	328.07	0.0000000	0.0601908	0.0000000	0.1553890	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.3530240	0.0000000	0.0000000	-2.9374399	-0.2287810
Vanadium	292.40	-1.8714000	0.0000000	0.0000000	0.0000000	-7.1342902
Zinc	206.20	0.0000000	0.0000000	0.0449999	0.0000000	1.1307900

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0297

Contract: _____ Lab Code: SVL Case No.: _____ SAS No.: _____

Instrument ID: OPTIMA5 Date: 04/14/2009

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Ni	Pb	Sb	Si	Ti
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	2.2514901
Antimony	206.84	-1.2747600	0.0000000	0.0000000	0.0000000	0.5643100
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	-2.2467799
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0877833
Cadmium	226.50	-0.9317070	0.0000000	0.0000000	-0.0433483	0.0474313
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	2.3506899
Copper	324.75	0.0000000	0.1601030	0.0000000	0.0000000	-0.4111630
Iron	273.96	0.0000000	0.0000000	0.0000000	0.5541570	-1.0916700
Lead	220.35	-0.1572070	0.0000000	-0.1107000	-0.1109380	0.1240180
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.4721630
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.5951680
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0297

Contract: _____ Lab Code: SVL Case No.: _____ SAS No.: _____

Instrument ID: OPTIMA5 Date: 04/14/2009

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Tl	V	Zn		
Aluminum	308.22	0.0000000	13.8899002	0.0000000		
Antimony	206.84	0.8422780	-0.5824730	0.0000000		
Arsenic	188.98	0.0000000	0.2895620	0.0000000		
Barium	233.53	0.0000000	0.0000000	0.0000000		
Beryllium	313.11	0.0000000	0.0000000	0.0000000		
Cadmium	226.50	0.0000000	0.0000000	0.0000000		
Calcium	315.89	0.0000000	0.0000000	0.0000000		
Chromium	267.72	0.0000000	0.1522110	0.0000000		
Cobalt	228.62	0.0000000	0.0000000	0.0000000		
Copper	324.75	0.0000000	0.0000000	0.0000000		
Iron	273.96	0.0000000	4.2176800	0.0000000		
Lead	220.35	0.1093620	0.1086980	0.0569096		
Magnesium	279.08	0.0000000	0.0000000	0.0000000		
Manganese	260.57	0.0000000	0.0000000	0.0000000		
Nickel	232.00	0.0000000	0.3359650	0.0000000		
Potassium	766.49	0.0000000	0.0000000	0.0000000		
Selenium	196.03	0.0000000	0.0000000	0.0000000		
Silver	328.07	0.0000000	-0.1139380	0.0000000		
Sodium	589.59	0.0000000	0.0000000	0.0000000		
Thallium	190.80	0.0000000	0.8225980	0.0000000		
Vanadium	292.40	0.0000000	0.0000000	0.0000000		
Zinc	206.20	0.0000000	0.0000000	0.0000000		

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0297

Contract: _____ Lab Code: SVL Case No.: _____ SAS No.: _____

Instrument ID: OPTIMA5 Date: 04/14/2009

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For:				
Aluminum	308.22					
Antimony	206.84					
Arsenic	188.98					
Barium	233.53					
Beryllium	313.11					
Cadmium	226.50					
Calcium	315.89					
Chromium	267.72					
Cobalt	228.62					
Copper	324.75					
Iron	273.96					
Lead	220.35					
Magnesium	279.08					
Manganese	260.57					
Nickel	232.00					
Potassium	766.49					
Selenium	196.03					
Silver	328.07					
Sodium	589.59					
Thallium	190.80					
Vanadium	292.40					
Zinc	206.20					

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA5 **Date:** 07/23/2008

Analyte	Integration Time (sec)	LDR ug/L
Copper	20.00	20000
Lead	20.00	100000

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: PE ICPMS DRC-E **Date:** 03/28/2009

Analyte	Integration Time (sec)	LDR ug/L
Arsenic	1.00	4000

- 13 -

SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Method:** MS

Case No.: **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number:	EPA 3010A-04202009						
W917018-BLK1	PBE	MB	SPLP	4/20/09	50.00	50.0	
W917018-BS1	LCSE	LCS	SPLP	4/20/09	50.00	50.0	
W9D0297-01	NMF-07HHRA-005S1	SAM	SPLP	4/20/09	50.00	50.0	
W917018-MS1	NMF-07HHRA-005S1S	MS	SPLP	4/20/09	50.00	50.0	
W917018-MSD1	NMF-07HHRA-005S1SD	MSD	SPLP	4/20/09	50.00	50.0	
W9D0297-02	NMF-07HHRA-005E1	SAM	SPLP	4/20/09	50.00	50.0	
W9D0297-03	EMF-07HHRA-002N1	SAM	SPLP	4/20/09	50.00	50.0	
W9D0297-04	EMF-07HHRA-002S1	SAM	SPLP	4/20/09	50.00	50.0	
W9D0297-05	EMF-07HHRA-004N1	SAM	SPLP	4/20/09	50.00	50.0	
W9D0297-06	EMF-07HHRA-004W1	SAM	SPLP	4/20/09	50.00	50.0	
W9D0297-07	EMF-07HHRA-003N1	SAM	SPLP	4/20/09	50.00	50.0	
W9D0297-08	EMF-07HHRA-003W1	SAM	SPLP	4/20/09	50.00	50.0	
W9D0297-09	EMF-07HHRA-005N1	SAM	SPLP	4/20/09	50.00	50.0	
W9D0297-10	EMF-07HHRA-005E1	SAM	SPLP	4/20/09	50.00	50.0	
W9D0297-11	EMF-07HHRA-BFD2	SAM	SPLP	4/20/09	50.00	50.0	

- 13 -

SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0297

Contract: **Lab Code:** SVL **Method:** P

Case No.: **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number:	EPA 3010A-04212009						
W917039-BLK1	PBE	MB	SPLP	4/21/09	50.00	50.0	
W917039-BS1	LCSE	LCS	SPLP	4/21/09	50.00	50.0	
W9D0297-01	NMF-07HHRA-005S1	SAM	SPLP	4/21/09	50.00	50.0	
W917039-MS1	NMF-07HHRA-005S1S	MS	SPLP	4/21/09	50.00	50.0	
W917039-MSD1	NMF-07HHRA-005S1SD	MSD	SPLP	4/21/09	50.00	50.0	
W9D0297-02	NMF-07HHRA-005E1	SAM	SPLP	4/21/09	50.00	50.0	
W9D0297-03	EMF-07HHRA-002N1	SAM	SPLP	4/21/09	50.00	50.0	
W9D0297-04	EMF-07HHRA-002S1	SAM	SPLP	4/21/09	50.00	50.0	
W9D0297-05	EMF-07HHRA-004N1	SAM	SPLP	4/21/09	50.00	50.0	
W9D0297-06	EMF-07HHRA-004W1	SAM	SPLP	4/21/09	50.00	50.0	
W9D0297-07	EMF-07HHRA-003N1	SAM	SPLP	4/21/09	50.00	50.0	
W9D0297-08	EMF-07HHRA-003W1	SAM	SPLP	4/21/09	50.00	50.0	
W9D0297-09	EMF-07HHRA-005N1	SAM	SPLP	4/21/09	50.00	50.0	
W9D0297-10	EMF-07HHRA-005E1	SAM	SPLP	4/21/09	50.00	50.0	
W9D0297-11	EMF-07HHRA-BFD2	SAM	SPLP	4/21/09	50.00	50.0	

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W9D0297

Instrument ID Number: PE ICPMS DRC-E Method: MS Run Number: 118D

Start Date: 04/28/2009 End Date: 04/28/2009

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN			
Cal Blank	1.00	0940				X																								
Cal Std 1	1.00	0942				X																								
Cal Std 2	1.00	0944				X																								
Cal Std 3	1.00	0946				X																								
Cal Std 4	1.00	0948				X																								
Cal Std 5	1.00	0950				X																								
Cal Std 6	1.00	0952				X																								
ICV	1.00	0954				X																								
ICB	1.00	0956				X																								
RLCS	1.00	0957				X																								
ICSA	1.00	0959				X																								
ICSAB	1.00	1001				X																								
CCV	1.00	1003				X																								
CCB	1.00	1005				X																								
PBE	2.50	1007				X																								
LCSE	2.50	1009				X																								
NMF-07HHRA-005S1	2.50	1011				X																								
NMF-07HHRA-005S1L	12.50	1013				X																								
NMF-07HHRA-005S1S	2.50	1014				X																								
NMF-07HHRA-005S1SD	2.50	1016				X																								
NMF-07HHRA-005E1	2.50	1018				X																								
EMF-07HHRA-002N1	2.50	1020				X																								
EMF-07HHRA-002S1	2.50	1022				X																								
EMF-07HHRA-004N1	2.50	1024				X																								
CCV	1.00	1026				X																								
CCB	1.00	1028				X																								
EMF-07HHRA-004W1	2.50	1030				X																								
EMF-07HHRA-003N1	2.50	1032				X																								
EMF-07HHRA-003W1	2.50	1033				X																								
EMF-07HHRA-005N1	2.50	1035				X																								
EMF-07HHRA-005E1	2.50	1037				X																								
EMF-07HHRA-BFD2	2.50	1039				X																								
CCV	1.00	1041				X																								
CCB	1.00	1043				X																								

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W9D0297

Instrument ID Number: OPTIMA5 Method: P Run Number: w917039

Start Date: 04/27/2009 End Date: 04/27/2009

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CALIB BLANK 1	1.00	0716											X		X											
STD1	1.00	0721											X		X											
STD2	1.00	0728																								
STD3	1.00	0733																								
STD4	1.00	0738																								
STD5	1.00	0743																								
ICV	1.00	0747											X		X											
ICB	1.00	0753											X		X											
CRI	1.00	0759											X		X											
ICSA	1.00	0804											X		X											
ICSAB	1.00	0811											X		X											
CCV	1.00	0817											X		X											
CCB	1.00	0823											X		X											
ZZZZZZ	1.00	0841																								
ZZZZZZ	1.00	0846																								
ZZZZZZ	1.00	0852																								
ZZZZZZ	1.00	0857																								
ZZZZZZ	1.00	0903																								
ZZZZZZ	1.00	0909																								
ZZZZZZ	1.00	0914																								
ZZZZZZ	1.00	0920																								
ZZZZZZ	1.00	0926																								
ZZZZZZ	1.00	0932																								
CCV	1.00	0938											X		X											
CCB	1.00	0944											X		X											
ZZZZZZ	1.00	1004																								
ZZZZZZ	1.00	1009																								
ZZZZZZ	1.00	1015																								
ZZZZZZ	1.00	1021																								
ZZZZZZ	1.00	1027																								
ZZZZZZ	1.00	1033																								
ZZZZZZ	1.00	1039																								
ZZZZZZ	1.00	1045																								
ZZZZZZ	1.00	1051																								
ZZZZZZ	1.00	1057																								
CCV	1.00	1103											X		X											

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W9D0297

Instrument ID Number: OPTIMA5 Method: P Run Number: w917039

Start Date: 04/27/2009 End Date: 04/27/2009

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CCB	1.00	1109											X		X											
ZZZZZZ	1.00	1115																								
CCV	1.00	1121											X		X											
CCB	1.00	1127											X		X											
PBE	1.00	1146											X		X											
LCSE	1.00	1151											X		X											
NMF-07HHRA-005S1	1.00	1157											X		X											
NMF-07HHRA-005S1S	1.00	1203											X		X											
NMF-07HHRA-005S1SD	1.00	1209											X		X											
NMF-07HHRA-005E1	1.00	1214											X		X											
EMF-07HHRA-002N1	1.00	1220											X		X											
EMF-07HHRA-002S1	1.00	1226											X		X											
EMF-07HHRA-004N1	1.00	1232											X		X											
EMF-07HHRA-004W1	1.00	1237											X		X											
CCV	1.00	1243											X		X											
CCB	1.00	1249											X		X											
EMF-07HHRA-003N1	1.00	1255											X		X											
EMF-07HHRA-003W1	1.00	1301											X		X											
EMF-07HHRA-005N1	1.00	1306											X		X											
EMF-07HHRA-005E1	1.00	1312											X		X											
EMF-07HHRA-BFD2	1.00	1318											X		X											
CCV	1.00	1324											X		X											
CCB	1.00	1330											X		X											

W917039

Log/Preparation Bench Sheet

See Extraction Comments

W917039

ICP 4079

Matrix: Solid
Prepared using: SOP 4079 (3010A)

Earliest Due: 04/29/09 Earliest Expiration: 09/29/09 08:50

				Origin	Hold Time Expires	Home Location	Client	Due Date
W917039-BLK1	Blank		[50mL - 50mL]					
W917039-BS1	LCS		[50mL - 50mL]	Spike 1: 09B0088				
W917039-MS1	Matrix Spike [W9D0297-01]		[50mL - 50mL]	Spike 1: 09B0088				
W917039-MSD1	MS Dup [W9D0297-01]		[50mL - 50mL]	Spike 1: 09B0088				
W9D0297-01	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	NMF-07HHRA-005S1		[50mL - 50mL]	Arizona	30-Sep-09 11:15	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-02	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	NMF-07HHRA-005E1		[50mL - 50mL]	Arizona	30-Sep-09 11:00	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-03	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-002N1		[50mL - 50mL]	Arizona	29-Sep-09 08:50	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-04	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-002S1		[50mL - 50mL]	Arizona	29-Sep-09 08:55	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-05	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-004N1		[50mL - 50mL]	Arizona	29-Sep-09 10:50	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-06	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-004W1		[50mL - 50mL]	Arizona	29-Sep-09 10:55	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-07	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-003N1		[50mL - 50mL]	Arizona	29-Sep-09 13:20	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-08	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-003W1		[50mL - 50mL]	Arizona	29-Sep-09 13:15	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-09	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-005N1		[50mL - 50mL]	Arizona	29-Sep-09 15:20	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-10	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-005E1		[50mL - 50mL]	Arizona	29-Sep-09 15:45	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-11	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-BFD2		[50mL - 50mL]	Arizona	30-Sep-09 12:30	WarmRoom 33 FL	Golder Associates (AZ)	

04/30/2009

Preparation Reagents

Standard	Description	Lot Number
08J0438	HCl, conc.	K2007

Standard	Description	Lot Number
09A0206	HNO3, conc.	K1408

Spike Standards

Standard	Description	Amount (µL)
09B0088	QC19115ScSn WATER DIG	500

Digested By: DT Date/Time: 4/21/09 0900/1500 Instrument ID: ICP Optima ☐1 ☒5 ☐6 ☐7

Analyzed By: DT Date/Time: 4/27/09

Reviewed By: DJS Date: 04/27/2009 Data File(s): 09117A

Instrument operating conditions and parameters for this analytical batch are as stated in

SVL ANALYTICAL, INC. KELLOGG, IDAHO

ICP-AES STANDARDS

STANDARD	SOURCE/LOT #	PREP DATE	PREP BY
S0/ICB/CCB	09D0347	4/24/2009	AS
S1	09D0231	4/20/2009	AS
S2	09D0179	4/16/2009	AS
S3	09D0180	4/16/2009	AS
S4	09C0243	3/23/2009	AS
S5	09C0224	3/21/2009	AS
ICV/CCV	09D0346	4/24/2009	AS
CRI	09D0182	4/16/2009	AS
ICSA	09D0295	4/22/2009	AS
ICSAB	09D0296	4/22/2009	AS

Analytical Standard Summary

09D0347

45

Description: S0
Standard Type: Calibration Standard
Solvent: 2% HNO3 5% HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 08E0100
Prepared: 23-Apr-09
Expires: 15-Oct-09

Comments: OPT 1 & 5

Analyte	CAS Number	Concentration	Units
Hydrochloric Acid	7647-01-0	50000	mg/L
Nitric Acid	7697-37-2	20000	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09D0201	HCl, conc.	Hydrochloric Ac	18-Apr-09	Vendor	15-Oct-09	1000000 ppm	50
09A0183	HNO3, conc.	Nitric Acid	15-Jan-09	Vendor	14-Jan-10	1000000 ppm	20

Anne Spradlin 4/24/09
Prepared By Date

DG 04/23/09
Reviewed By Date

Analytical Standard Summary

09D0231

46

Description: S1
Standard Type: Calibration Standard
Solvent: 2% HNO3 5% HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : -
Prepared: 20-Apr-09
Expires: 26-Jul-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	3	mg/L
Antimony	7440-36-0	3	mg/L
Arsenic	7440-38-2	3	mg/L
Barium	7440-39-3	3	mg/L
Beryllium	7440-41-7	3	mg/L
Bismuth	7440-69-9	5	mg/L
Boron	7440-42-8	3	mg/L
Cadmium	7440-43-9	3	mg/L
Calcium	7440-70-2	3	mg/L
Chromium	7440-47-3	3	mg/L
Cobalt	7440-48-4	3	mg/L
Copper	7440-50-8	3	mg/L
Gallium	7440-55-3	5	mg/L
Iron	7439-89-6	3	mg/L
Lead	7439-92-1	3	mg/L
Lithium	7439-93-2	8	mg/L
Magnesium	7439-95-4	3	mg/L
Manganese	7439-96-5	3	mg/L
ybdenum	7439-98-7	3	mg/L
ickel	7440-02-0	3	mg/L
Phosphorus	7723-14-0	10	mg/L
Potassium	7440-09-7	30	mg/L
Selenium	7782-49-2	3	mg/L
Silica (SiO2)	7631-86-9	3.21	mg/L
Silicon	7440-21-3	1.5	mg/L
Silver	7440-22-4	3	mg/L
Sodium	7440-23-5	3	mg/L
Strontium	7440-24-6	5	mg/L
Thallium	7440-28-0	3	mg/L
Tin	7440-31-5	5	mg/L
Titanium	7440-32-6	3	mg/L
Vanadium	7440-62-2	3	mg/L
Zinc	7440-66-6	3	mg/L

Analytical Standard Summary

09D0231

47

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0292	S1 MIX	Strontium	26-Jan-09	Anne Spradlin	26-Jul-09	500 mg/L	10
09A0292	S1 MIX	Phosphorus	26-Jan-09	Anne Spradlin	26-Jul-09	1000 mg/L	10
09A0292	S1 MIX	Lithium	26-Jan-09	Anne Spradlin	26-Jul-09	800 mg/L	10
09A0292	S1 MIX	Gallium	26-Jan-09	Anne Spradlin	26-Jul-09	500 mg/L	10
09A0292	S1 MIX	Bismuth	26-Jan-09	Anne Spradlin	26-Jul-09	500 mg/L	10
09A0292	S1 MIX	Tin	26-Jan-09	Anne Spradlin	26-Jul-09	500 mg/L	10
08J0535	QCS-26 (0816542)	Barium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Iron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Copper	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Cobalt	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Chromium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Calcium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Cadmium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Lead	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Beryllium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Potassium	30-Oct-08	Vendor	16-Oct-09	1000 ug/mL	30
08J0535	QCS-26 (0816542)	Arsenic	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Antimony	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Boron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Magnesium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Manganese	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Aluminum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Nickel	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Selenium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Silica (SiO2)	30-Oct-08	Vendor	16-Oct-09	107 ug/mL	30
08J0535	QCS-26 (0816542)	Silicon	30-Oct-08	Vendor	16-Oct-09	50 ug/mL	30
08J0535	QCS-26 (0816542)	Silver	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Sodium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Thallium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Titanium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Vanadium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Zinc	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Molybdenum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30

Anne Spradlin 4/20/09

Prepared By Date

DT 4/22/09

Reviewed By Date

Analytical Standard Summary

09D0179

48

Description: S2
Standard Type: Calibration Standard
Solvent: 2%HN03 5% HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 192-262-1
Prepared: 16-Apr-09
Expires: 13-Oct-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	50	mg/L
Calcium	7440-70-2	50	mg/L
Iron	7439-89-6	50	mg/L
Magnesium	7439-95-4	50	mg/L
Sodium	7440-23-5	50	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08H0316	Sodium	Sodium	26-Aug-08	Vendor	19-Feb-10	10000 ug/mL	5
08H0314	Iron	Iron	26-Aug-08	Vendor	19-Feb-10	10000 ug/mL	5
08H0313	Calcium	Calcium	26-Aug-08	Vendor	19-Feb-10	10000 ug/mL	5
08H0312	Aluminum	Aluminum	26-Aug-08	Vendor	19-Feb-10	10000 ug/mL	5
08F0350	Magnesium	Magnesium	23-Jun-08	Vendor	12-Dec-09	10000 ug/mL	5

Anne Spradlin 4/16/09
Prepared By Date

DT 4/22/09
Reviewed By Date

Analytical Standard Summary

09D0180

49

Description: S3
Standard Type: Calibration Standard
Solvent: 2%HNO3 5%HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 192-262-2
Prepared: 16-Apr-09
Expires: 07-Jun-09

Comments:

Analyte	CAS Number	Concentration	Units
Beryllium	7440-41-7	0.1	mg/L
Lanthanum	7439-91-0	10	mg/L
Scandium	7440-20-2	2	mg/L
Silica (SiO2)	7631-86-9	53.5	mg/L
Silicon	7440-21-3	25	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0111	Lanthanum	Lanthanum	12-Jan-09	Vendor	30-Jun-10	10000 ug/mL	1
07L0017	Silicon	Silicon	14-Dec-07	Vendor	07-Jun-09	10000 ug/mL	2.5
07L0017	Silicon	Silica (SiO2)	14-Dec-07	Vendor	07-Jun-09	21400 ug/mL	2.5
07L0011	Beryllium	Beryllium	14-Dec-07	Vendor	07-Jun-09	1000 ug/mL	0.1
08D0085	Scandium	Scandium	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.2

Anne Spradlin 4/16/09
Prepared By Date

DT 4/22/09
Reviewed By Date

Analytical Standard Summary

09C0243

50

Description: S4
Standard Type: Calibration Standard
Solvent: 2%HNO3 5%HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 192-264-4
Prepared: 23-Mar-09
Expires: 19-Sep-09

Comments:

Analyte	CAS Number	Concentration	Units
Cerium	7440-45-1	1	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08F0352	Cerium	Cerium	23-Jun-08	Vendor	12-Dec-09	1000 ug/mL	1

Anne Spradlin 3/23/09
Prepared By Date

DG 03/26/2009
Reviewed By Date

Analytical Standard Summary

09C0224

51

Description: S5
Standard Type: Calibration Standard
Solvent: 2%HNO3 5%HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 192-259-13
Prepared: 21-Mar-09
Expires: 15-Jul-09

Comments:

Analyte	CAS Number	Concentration	Units
Uranium	7440-61-1	2	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08A0058	Uranium	Uranium	28-Jan-08	Vendor	15-Jul-09	1000 ug/mL	2

Anne Spradlin 3/21/09
Prepared By Date

DG 03/26/2009
Reviewed By Date

Analytical Standard Summary

09D0346

Description: ICV/CCV
Standard Type: Calibration Standard
Solvent: 2%HNO3/5%HCL
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 08E0063
Prepared: 23-Apr-09
Expires: 15-Jul-09

Comments: OPT 1 & 5

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	2	ug/mL
Antimony	7440-36-0	2	ug/mL
Arsenic	7440-38-2	2	ug/mL
Barium	7440-39-3	2	ug/mL
Beryllium	7440-41-7	2	ug/mL
Bismuth	7440-69-9	4	ug/mL
Boron	7440-42-8	2	ug/mL
Cadmium	7440-43-9	2	ug/mL
Calcium	7440-70-2	2	ug/mL
Chromium	7440-47-3	2	ug/mL
Cobalt	7440-48-4	2	ug/mL
Copper	7440-50-8	2	ug/mL
Gallium	7440-55-3	4	ug/mL
Iron	7439-89-6	2	ug/mL
Lanthanum	7439-91-0	4	ug/mL
Lead	7439-92-1	2	ug/mL
Lithium	7439-93-2	4	ug/mL
Magnesium	7439-95-4	2	ug/mL
Manganese	7439-96-5	2	ug/mL
Molybdenum	7439-98-7	2	ug/mL
Nickel	7440-02-0	2	ug/mL
Phosphorus	7723-14-0	10	ug/mL
Potassium	7440-09-7	20	ug/mL
Scandium	7440-20-2	1	ug/mL
Selenium	7782-49-2	2	ug/mL
Silica (SiO2)	7631-86-9	21.4	ug/mL
Silicon	7440-21-3	10	ug/mL
Silver	7440-22-4	2	ug/mL
Sodium	7440-23-5	20	ug/mL
Strontium	7440-24-6	2	ug/mL
Thallium	7440-28-0	2	ug/mL
Tin	7440-31-5	4	ug/mL
Titanium	7440-32-6	2	ug/mL
Uranium	7440-61-1	1	ug/mL
Vanadium	7440-62-2	2	ug/mL
Zirconium	7440-66-6	2	ug/mL

Analytical Standard Summary

09D0346

53

Parent Standards used in this standard:

ndard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0111	Lanthanum	Lanthanum	12-Jan-09	Vendor	30-Jun-10	10000 ug/mL	0.4
08C0081	Uranium	Uranium	10-Mar-08	Vendor	29-Aug-09	1000 ug/mL	1
08J0545	Strontium	Strontium	30-Oct-08	Vendor	21-Apr-10	10000 ug/mL	0.2
08J0536	QCS-26 (0816541)	Beryllium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Iron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Cobalt	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Chromium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Calcium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Magnesium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Boron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Lead	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Barium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Arsenic	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Antimony	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Aluminum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Cadmium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Thallium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Zinc	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Copper	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Titanium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Manganese	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Silver	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Silicon	30-Oct-08	Vendor	16-Oct-09	50 ug/mL	20
08J0536	QCS-26 (0816541)	Silica (SiO2)	30-Oct-08	Vendor	16-Oct-09	107 ug/mL	20
08J0536	QCS-26 (0816541)	Selenium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
[illegible]0536	QCS-26 (0816541)	Potassium	30-Oct-08	Vendor	16-Oct-09	1000 ug/mL	20
[illegible]0536	QCS-26 (0816541)	Nickel	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Molybdenum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Vanadium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0544	Phosphorous	Phosphorus	30-Oct-08	Vendor	16-Apr-10	10000 ug/mL	1
08J0546	Tin	Tin	30-Oct-08	Vendor	16-Apr-10	10000 ug/mL	0.4
08A0060	Sodium	Sodium	28-Jan-08	Vendor	15-Jul-09	10000 ug/mL	1.8
08D0086	Lithium	Lithium	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.4
08D0085	Scandium	Scandium	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.1
08D0084	Bismuth	Bismuth	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.4
08D0083	Gallium	Gallium	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.4

Anne Spadler 4/24/09

Prepared By Date

DG 04/23/09

Reviewed By Date

Analytical Standard Summary

09D0182

54

Description: CRI SOLUTION
Standard Type: Calibration Standard
Solvent: 2%HNO3/5%HCL
Final Volume 500
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 08D0147
Prepared: 16-Apr-09
Expires: 07-Jun-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	0.08	ug/mL
Antimony	7440-36-0	0.02	ug/mL
Arsenic	7440-38-2	0.025	ug/mL
Barium	7440-39-3	0.004	ug/mL
Beryllium	7440-41-7	0.002	ug/mL
Bismuth	7440-69-9	0.06	ug/mL
Boron	7440-42-8	0.04	ug/mL
Cadmium	7440-43-9	0.002	ug/mL
Calcium	7440-70-2	0.04	ug/mL
Chromium	7440-47-3	0.006	ug/mL
Cobalt	7440-48-4	0.006	ug/mL
Copper	7440-50-8	0.01	ug/mL
Gallium	7440-55-3	0.02	ug/mL
Hydrochloric Acid	7647-01-0	7.5	ug/mL
Iron	7439-89-6	0.06	ug/mL
Lanthanum	7439-91-0	0.005	ug/mL
Lead	7439-92-1	0.0075	ug/mL
Lithium	7439-93-2	0.02	ug/mL
[illegible]nesium	7439-95-4	0.06	ug/mL
[illegible]nganese	7439-96-5	0.004	ug/mL
Molybdenum	7439-98-7	0.008	ug/mL
Nickel	7440-02-0	0.01	ug/mL
Phosphorus	7723-14-0	0.05	ug/mL
Potassium	7440-09-7	0.5	ug/mL
Scandium	7440-20-2	0.002	ug/mL
Selenium	7782-49-2	0.04	ug/mL
Silica (SiO2)	7631-86-9	0.171	ug/mL
Silicon	7440-21-3	0.08	ug/mL
Silver	7440-22-4	0.005	ug/mL
Sodium	7440-23-5	0.5	ug/mL
Strontium	7440-24-6	0.005	ug/mL
Thallium	7440-28-0	0.015	ug/mL
Tin	7440-31-5	0.05	ug/mL
Titanium	7440-32-6	0.005	ug/mL
Uranium	7440-61-1	0.02	ug/mL
Vanadium	7440-62-2	0.005	ug/mL
Zinc	7440-66-6	0.01	ug/mL

Analytical Standard Summary

09D0182

55

Parent Standards used in this standard:

dard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0293	CRI STOCK	Calcium	26-Jan-09	Anne Spradlin	07-Jun-09	4 ug/mL	5
09A0293	CRI STOCK	Lead	26-Jan-09	Anne Spradlin	07-Jun-09	0.75 ug/mL	5
09A0293	CRI STOCK	Lanthanum	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5
09A0293	CRI STOCK	Iron	26-Jan-09	Anne Spradlin	07-Jun-09	6 ug/mL	5
09A0293	CRI STOCK	Hydrochloric Ac	26-Jan-09	Anne Spradlin	07-Jun-09	750 ug/mL	5
09A0293	CRI STOCK	Gallium	26-Jan-09	Anne Spradlin	07-Jun-09	2 ug/mL	5
09A0293	CRI STOCK	Copper	26-Jan-09	Anne Spradlin	07-Jun-09	1 ug/mL	5
09A0293	CRI STOCK	Aluminum	26-Jan-09	Anne Spradlin	07-Jun-09	8 ug/mL	5
09A0293	CRI STOCK	Chromium	26-Jan-09	Anne Spradlin	07-Jun-09	0.6 ug/mL	5
09A0293	CRI STOCK	Manganese	26-Jan-09	Anne Spradlin	07-Jun-09	0.4 ug/mL	5
09A0293	CRI STOCK	Cadmium	26-Jan-09	Anne Spradlin	07-Jun-09	0.2 ug/mL	5
09A0293	CRI STOCK	Boron	26-Jan-09	Anne Spradlin	07-Jun-09	4 ug/mL	5
09A0293	CRI STOCK	Bismuth	26-Jan-09	Anne Spradlin	07-Jun-09	6 ug/mL	5
09A0293	CRI STOCK	Beryllium	26-Jan-09	Anne Spradlin	07-Jun-09	0.2 ug/mL	5
09A0293	CRI STOCK	Barium	26-Jan-09	Anne Spradlin	07-Jun-09	0.4 ug/mL	5
09A0293	CRI STOCK	Arsenic	26-Jan-09	Anne Spradlin	07-Jun-09	2.5 ug/mL	5
09A0293	CRI STOCK	Antimony	26-Jan-09	Anne Spradlin	07-Jun-09	2 ug/mL	5
09A0293	CRI STOCK	Cobalt	26-Jan-09	Anne Spradlin	07-Jun-09	0.6 ug/mL	5
09A0293	CRI STOCK	Silica (SiO2)	26-Jan-09	Anne Spradlin	07-Jun-09	17.1 ug/mL	5
09A0293	CRI STOCK	Vanadium	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5
09A0293	CRI STOCK	Uranium	26-Jan-09	Anne Spradlin	07-Jun-09	2 ug/mL	5
09A0293	CRI STOCK	Titanium	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5
09A0293	CRI STOCK	Tin	26-Jan-09	Anne Spradlin	07-Jun-09	5 ug/mL	5
09A0293	CRI STOCK	Thallium	26-Jan-09	Anne Spradlin	07-Jun-09	1.5 ug/mL	5
09A0293	CRI STOCK	Strontium	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5
[illegible]0293	CRI STOCK	Sodium	26-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	5
[illegible]0293	CRI STOCK	Lithium	26-Jan-09	Anne Spradlin	07-Jun-09	2 ug/mL	5
09A0293	CRI STOCK	Silicon	26-Jan-09	Anne Spradlin	07-Jun-09	8 ug/mL	5
09A0293	CRI STOCK	Magnesium	26-Jan-09	Anne Spradlin	07-Jun-09	6 ug/mL	5
09A0293	CRI STOCK	Selenium	26-Jan-09	Anne Spradlin	07-Jun-09	4 ug/mL	5
09A0293	CRI STOCK	Scandium	26-Jan-09	Anne Spradlin	07-Jun-09	0.2 ug/mL	5
09A0293	CRI STOCK	Potassium	26-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	5
09A0293	CRI STOCK	Phosphorus	26-Jan-09	Anne Spradlin	07-Jun-09	5 ug/mL	5
09A0293	CRI STOCK	Nickel	26-Jan-09	Anne Spradlin	07-Jun-09	1 ug/mL	5
09A0293	CRI STOCK	Molybdenum	26-Jan-09	Anne Spradlin	07-Jun-09	0.8 ug/mL	5
09A0293	CRI STOCK	Zinc	26-Jan-09	Anne Spradlin	07-Jun-09	1 ug/mL	5
09A0293	CRI STOCK	Silver	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5

Anne Spradlin 4/16/09

Prepared By Date

DT 4/22/09

Reviewed By Date

Analytical Standard Summary

09D0295

56

Description: ICSA
Standard Type: Calibration Standard
Solvent: 2%HNO3 5%HCl
Final Volume 200
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 88E
Prepared: 22-Apr-09
Expires: 07-Jun-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	500	mg/L
Calcium	7440-70-2	500	mg/L
Chromium	7440-47-3	10	mg/L
Copper	7440-50-8	10	mg/L
Iron	7439-89-6	200	mg/L
Magnesium	7439-95-4	500	mg/L
Manganese	7439-96-5	10	mg/L
Nickel	7440-02-0	10	mg/L
Titanium	7440-32-6	10	mg/L
Vanadium	7440-62-2	10	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0118	Manganese	Manganese	12-Jan-09	Vendor	30-Jun-10	1000 ug/mL	2
09A0117	Nickel	Nickel	12-Jan-09	Vendor	30-Jun-10	1000 ug/mL	2
09A0116	Titanium	Titanium	12-Jan-09	Vendor	30-Jun-10	1000 ug/mL	2
0538	CLP-INF-1 (0805302)	Magnesium	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Iron	30-Oct-08	Vendor	16-Oct-09	2000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Calcium	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Aluminum	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08E0345	Vanadium	Vanadium	22-Jun-08	Vendor	12-Dec-09	1000 ug/mL	2
07L0014	Copper	Copper	14-Dec-07	Vendor	07-Jun-09	1000 ug/mL	2
07L0013	Chromium	Chromium	14-Dec-07	Vendor	07-Jun-09	1000 ug/mL	2

Anne Spradlin 4/22/09
Prepared By Date

DG 04/22/09
Reviewed By Date

Analytical Standard Summary

09D0296

57

Description: ICSAB SOLUTION
Standard Type: Calibration Standard
Solvent: 2%HNO3/5%HCL
Final Volume 200
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 08E0060
Prepared: 22-Apr-09
Expires: 07-Jun-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	500	mg/L
Antimony	7440-36-0	0.5	mg/L
Arsenic	7440-38-2	0.5	mg/L
Barium	7440-39-3	0.5	mg/L
Beryllium	7440-41-7	0.5	mg/L
Cadmium	7440-43-9	0.5	mg/L
Calcium	7440-70-2	500	mg/L
Chromium	7440-47-3	0.5	mg/L
Cobalt	7440-48-4	0.5	mg/L
Copper	7440-50-8	0.5	mg/L
Iron	7439-89-6	200	mg/L
Lead	7439-92-1	0.5	mg/L
Magnesium	7439-95-4	500	mg/L
Manganese	7439-96-5	0.5	mg/L
Nickel	7440-02-0	0.5	mg/L
Selenium	7782-49-2	0.5	mg/L
Silver	7440-22-4	0.5	mg/L
Thallium	7440-28-0	0.5	mg/L
nium	7440-61-1	0.5	mg/L
anadium	7440-62-2	0.5	mg/L
Zinc	7440-66-6	0.5	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08J0538	CLP-INF-1 (0805302)	Calcium	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Iron	30-Oct-08	Vendor	16-Oct-09	2000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Magnesium	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Aluminum	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
09A0309	ICSAB STOCK	Cobalt	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Antimony	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Arsenic	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Barium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Beryllium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Chromium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Zinc	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Copper	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Lead	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Manganese	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Nickel	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Selenium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Thallium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Uranium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Vanadium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
0309	ICSAB STOCK	Cadmium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
0184	Silver	Silver	13-Nov-08	Vendor	04-May-10	1000 ug/mL	0.1

Anne Spradlin 4/22/09
Prepared By Date

DG 04/22/09
Reviewed By Date

ICP CONTROL SHEET

Instrument: Optima 5 Date: 04/27/09 Data File: 09117A

Operator: DT Time: 716

Sample	Time	Elements Out of Control	Comments	Batch
ICV 5% 200.7	747	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		W914144
ICV 10% 6010B		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		W916298
ICB	753	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		W916237
CRI		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		W916242
ICSA	804	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
ICSB		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV1	817	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB1		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV2	938	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB2		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV3	1103	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB3		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV4	1121	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB4		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV5	1243	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB5		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV6	242	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB6		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV7	327	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB7		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV8	458	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe ~~Ga~~ K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB8		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV9	552	Ag Al As B Ba Be Bi ~~Ca~~ Cd Co Cr ~~Cu~~ Fe ~~Ga~~ K La ~~Li~~ Mg Mn Mo ~~Na~~ Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V ~~Zn~~		
CCB9		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV10		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB10		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		

59

==========

Analysis Begun

Start Time: 4/27/2009 7:15:56 AM
Logged In Analyst: Optima5
Spectrometer Model: Optima 5300 DV, S/N 077N5011902
Plasma On Time: 4/27/2009 6:27:37 AM
Technique: ICP Continuous
Autosampler Model: AS-93plus

Sample Information File: C:\pe\Administrator\Sample Information\START.sif
Batch ID:
Results Data Set: 09117A
Results Library: C:\pe\Administrator\Results\Results.mdb

==========

Method Loaded
Method Name: OPT5
IEC File: OPTIMA5.iec
Method Description:
Method Last Saved: 4/20/2009 3:46:10 PM
MSF File:

==========

Sequence No.: 1
Sample ID: Calib Blank 1
Analyst:
Initial Sample Wt:
Dilution:
Autosampler Location: 1
Date Collected: 4/27/2009 7:16:05 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: Calib Blank 1

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	125104.3	353.37	0.28%	100.000	%
Lu 261.542 A	2375816.1	4215.81	0.18%	100.000	%
Ag 328.068 At	-213.7	9.29	4.35%	[0.00]	mg/L
Al 308.215 Rt	115.4	1.33	1.16%	[0.00]	mg/L
As 188.979 At	-7.2	0.35	4.94%	[0.00]	mg/L
B 249.677 Rt	3.1	2.56	83.02%	[0.00]	mg/L
Ba 233.527 At	-39.7	0.11	0.27%	[0.00]	mg/L
Be 313.107 Rt	91.5	1.28	1.39%	[0.00]	mg/L
Bi 222.821 At	34.5	1.70	4.92%	[0.00]	mg/L
Ca 315.887 Rt	-40.1	3.66	9.12%	[0.00]	mg/L
Cd 226.502 At	-73.3	3.45	4.70%	[0.00]	mg/L
Ce 418.660 At	382.7	14.03	3.67%	[0.00]	mg/L
Co 228.616 At	-87.2	1.14	1.31%	[0.00]	mg/L
Cr 267.716 At	168.0	0.18	0.11%	[0.00]	mg/L
Cu 324.752 At	2682.6	8.72	0.32%	[0.00]	mg/L
Fe 273.955 Rt	1.9	2.51	131.25%	[0.00]	mg/L
Ga 417.206 At	-78.3	14.39	18.37%	[0.00]	mg/L
K 766.490 Rt	303.4	10.67	3.52%	[0.00]	mg/L
La 379.478 At	-489.0	12.92	2.64%	[0.00]	mg/L
Li 670.784 Rt	284.0	0.54	0.19%	[0.00]	mg/L
Mg 279.077 Rt	2.2	0.02	0.92%	[0.00]	mg/L
Mn 260.568 Rt	-0.8	0.73	94.34%	[0.00]	mg/L
Mo 202.031 At	34.4	0.56	1.64%	[0.00]	mg/L
Na 589.592 Rt	619.5	8.52	1.38%	[0.00]	mg/L
Ni 232.003 At	-93.9	2.42	2.58%	[0.00]	mg/L
P 213.617 At	-64.4	2.17	3.38%	[0.00]	mg/L
Pb 220.353 At	50.7	2.99	5.89%	[0.00]	mg/L
Sb 206.836 At	-6.1	2.60	42.94%	[0.00]	mg/L
Sc 361.383 At	1.9	5.56	293.94%	[0.00]	mg/L
Se 196.026 At	-23.6	2.02	8.60%	[0.00]	mg/L
Si 251.611 Rt	46.6	1.75	3.75%	[0.00]	mg/L
SIO2 251.611 Rt	46.6	1.75	3.75%	[0.00]	mg/L
Sn 189.927 At	-33.9	0.50	1.48%	[0.00]	mg/L
Sr 421.552 Rt	187.2	2.63	1.41%	[0.00]	mg/L
Ti 336.121 At	-465.3	12.79	2.75%	[0.00]	mg/L
Tl 190.801 At	-8.7	0.22	2.52%	[0.00]	mg/L
U 385.958 At	770.5	21.66	2.81%	[0.00]	mg/L
V 292.402 At	-195.5	7.55	3.86%	[0.00]	mg/L
Zn 206.200 At	13.6	0.83	6.14%	[0.00]	mg/L

60

Sequence No.: 2
Sample ID: STD1
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 2
Date Collected: 4/27/2009 7:21:50 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD1

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	121904.9	409.51	0.34%	97.4426	%
Lu 261.542 A	2291599.6	1316.73	0.06%	96.4553	%
Ag 328.068 At	407356.9	671.70	0.16%	[3]	mg/L
As 188.979 At	2411.2	13.71	0.57%	[3]	mg/L
B 249.677 Rt	5595.7	3.26	0.06%	[3]	mg/L
Ba 233.527 At	118841.7	180.04	0.15%	[3]	mg/L
Be 313.107 Rt	400584.9	892.29	0.22%	[3]	mg/L
Bi 222.821 At	5348.2	16.94	0.32%	[5]	mg/L
Cd 226.502 At	96759.5	88.46	0.09%	[3]	mg/L
Co 228.616 At	48866.4	29.62	0.06%	[3]	mg/L
Cr 267.716 At	112811.9	123.64	0.11%	[3]	mg/L
Cu 324.752 At	503546.6	2106.11	0.42%	[3]	mg/L
Ga 417.206 At	421138.8	1825.49	0.43%	[5]	mg/L
K 766.490 Rt	74402.1	9.92	0.01%	[30]	mg/L
Li 670.784 Rt	862842.0	5621.60	0.65%	[8]	mg/L
Mn 260.568 Rt	38751.2	96.44	0.25%	[3]	mg/L
Mo 202.031 At	23648.3	13.53	0.06%	[3]	mg/L
Ni 232.003 At	29175.3	42.84	0.15%	[3]	mg/L
P 213.617 At	15276.0	130.15	0.85%	[10]	mg/L
Pb 220.353 At	10518.1	77.84	0.74%	[3]	mg/L
Sb 206.836 At	4920.6	29.40	0.60%	[3]	mg/L
Se 196.026 At	1302.9	5.48	0.42%	[3]	mg/L
Sn 189.927 At	12149.2	95.28	0.78%	[5]	mg/L
Sr 421.552 Rt	3562476.7	22785.45	0.64%	[5]	mg/L
Ti 336.121 At	753044.8	2685.29	0.36%	[3]	mg/L
Tl 190.801 At	2227.8	17.69	0.79%	[3]	mg/L
V 292.402 At	243650.5	235.63	0.10%	[3]	mg/L
Zn 206.200 At	26479.7	108.65	0.41%	[3]	mg/L

Sequence No.: 3
Sample ID: STD2
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 3
Date Collected: 4/27/2009 7:28:33 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD2

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	123113.0	869.04	0.71%	98.4083	%
Lu 261.542 A	2297430.9	6610.91	0.29%	96.7007	%
Al 308.215 R†	60258.1	330.43	0.55%	[50]	mg/L
Ca 315.887 R†	173482.0	36.24	0.02%	[50]	mg/L
Fe 273.955 R†	28309.3	199.65	0.71%	[50]	mg/L
Mg 279.077 R†	24633.2	84.32	0.34%	[50]	mg/L
Na 589.592 R†	354263.3	165.87	0.05%	[50]	mg/L

Sequence No.: 4
Sample ID: STD3
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 4
Date Collected: 4/27/2009 7:33:21 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD3

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	124599.9	67.34	0.05%	99.5968	%
Lu 261.542 A	2388711.4	1494.49	0.06%	100.543	%
La 379.478 A†	2132547.6	1511.23	0.07%	[10]	mg/L
Sc 361.383 A†	2410159.6	1671.46	0.07%	[2]	mg/L
Si 251.611 R†	33493.0	132.86	0.40%	[25]	mg/L
SIO2 251.611 R†	33493.0	132.86	0.40%	[53.5]	mg/L

63

Sequence No.: 5
Sample ID: STD4
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 5
Date Collected: 4/27/2009 7:38:40 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD4

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	125499.9	1139.94	0.91%	100.316	%
Lu 261.542 A	2347807.0	4977.42	0.21%	98.8211	%
Ce 418.660 At	61010.6	428.38	0.70%	[1]	mg/L

Sequence No.: 6
Sample ID: STD5
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 14
Date Collected: 4/27/2009 7:43:07 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD5

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	123820.9	155.68	0.13%	98.9741	%
Lu 261.542 A	2334220.8	9559.13	0.41%	98.2492	%
U 385.958 At	34676.0	37.82	0.11%	[2.0]	mg/L

Calibration Summary

Analyte	Stds.	Equation	Intercept	Slope	Curvature	Corr. Coef.	Reslope
Ag 328.068 A	1	Lin, Calc Int	0.0	135800	0.00000	1.000000	
Al 308.215 R	1	Lin, Calc Int	0.0	1205	0.00000	1.000000	
As 188.979 A	1	Lin, Calc Int	-0.0	803.7	0.00000	1.000000	
B 249.677 R	1	Lin, Calc Int	0.0	1865	0.00000	1.000000	
Ba 233.527 A	1	Lin, Calc Int	0.0	39610	0.00000	1.000000	
Be 313.107 R	1	Lin, Calc Int	0.0	133500	0.00000	1.000000	
Bi 222.821 A	1	Lin, Calc Int	0.0	1070	0.00000	1.000000	
Ca 315.887 R	1	Lin, Calc Int	0.0	3470	0.00000	1.000000	
Cd 226.502 A	1	Lin, Calc Int	0.0	32250	0.00000	1.000000	
Ce 418.660 A	1	Lin, Calc Int	0.0	61010	0.00000	1.000000	
Co 228.616 A	1	Lin, Calc Int	0.0	16290	0.00000	1.000000	
Cr 267.716 A	1	Lin, Calc Int	0.0	37600	0.00000	1.000000	
Cu 324.752 A	1	Lin, Calc Int	0.0	167800	0.00000	1.000000	
Fe 273.955 R	1	Lin, Calc Int	-0.0	566.2	0.00000	1.000000	
Ga 417.206 A	1	Lin, Calc Int	-0.0	84230	0.00000	1.000000	
K 766.490 R	1	Lin, Calc Int	0.0	2480	0.00000	1.000000	
La 379.478 A	1	Lin, Calc Int	0.0	213300	0.00000	1.000000	
Li 670.784 R	1	Lin, Calc Int	0.0	107900	0.00000	1.000000	
Mg 279.077 R	1	Lin, Calc Int	0.0	492.7	0.00000	1.000000	
Mn 260.568 R	1	Lin, Calc Int	0.0	12920	0.00000	1.000000	
Mo 202.031 A	1	Lin, Calc Int	0.0	7883	0.00000	1.000000	
Na 589.592 R	1	Lin, Calc Int	0.0	7085	0.00000	1.000000	
Ni 232.003 A	1	Lin, Calc Int	0.0	9725	0.00000	1.000000	
P 213.617 A	1	Lin, Calc Int	-0.0	1528	0.00000	1.000000	
Pb 220.353 A	1	Lin, Calc Int	0.0	3506	0.00000	1.000000	
Sb 206.836 A	1	Lin, Calc Int	0.0	1640	0.00000	1.000000	
Sc 361.383 A	1	Lin, Calc Int	0.0	1205000	0.00000	1.000000	
Se 196.026 A	1	Lin, Calc Int	0.0	434.3	0.00000	1.000000	
Si 251.611 R	1	Lin, Calc Int	0.0	1340	0.00000	1.000000	
SIO2 251.611 R	1	Lin, Calc Int	0.0	626.0	0.00000	1.000000	
Sn 189.927 A	1	Lin, Calc Int	0.0	2430	0.00000	1.000000	
Sr 421.552 R	1	Lin, Calc Int	0.0	712500	0.00000	1.000000	
Ti 336.121 A	1	Lin, Calc Int	0.0	251000	0.00000	1.000000	
Tl 190.801 A	1	Lin, Calc Int	0.0	742.6	0.00000	1.000000	
U 385.958 A	1	Lin, Calc Int	0.0	17340	0.00000	1.000000	
V 292.402 A	1	Lin, Calc Int	0.0	81220	0.00000	1.000000	
Zn 206.200 A	1	Lin, Calc Int	0.0	8827	0.00000	1.000000	

Sequence No.: 7
Sample ID: ICV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 6
Date Collected: 4/27/2009 7:47:30 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ICV

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	124885.8	99.8253	%	1.04124				1.04%
Lu 261.542 A	2340021.3	98.4934	%	0.29176				0.30%
Ag 328.068 At	276689.1	2.03732	mg/L	0.004337	2.03732	mg/L	0.004337	0.21%
QC value within limits for Ag 328.068 A Recovery = 101.87%								
Al 308.215 Rt	2601.2	2.05879	mg/L	0.016686	2.05879	mg/L	0.016686	0.81%
QC value within limits for Al 308.215 R Recovery = 102.94%								
As 188.979 At	1758.7	2.05874	mg/L	0.014125	2.05874	mg/L	0.014125	0.69%
QC value within limits for As 188.979 A Recovery = 102.94%								
B 249.677 Rt	3802.7	2.03951	mg/L	0.029260	2.03951	mg/L	0.029260	1.43%
QC value within limits for B 249.677 R Recovery = 101.98%								
Ba 233.527 At	81604.5	2.06011	mg/L	0.003027	2.06011	mg/L	0.003027	0.15%
QC value within limits for Ba 233.527 A Recovery = 103.01%								
Be 313.107 Rt	265750.4	1.99014	mg/L	0.004827	1.99014	mg/L	0.004827	0.24%
QC value within limits for Be 313.107 R Recovery = 99.51%								
Bi 222.821 At	4233.9	3.80782	mg/L	0.001455	3.80782	mg/L	0.001455	0.04%
QC value within limits for Bi 222.821 A Recovery = 95.20%								
Ca 315.887 Rt	7138.4	2.04605	mg/L	0.023321	2.04605	mg/L	0.023321	1.14%
QC value within limits for Ca 315.887 R Recovery = 102.30%								
Cd 226.502 At	66049.1	2.04914	mg/L	0.003608	2.04914	mg/L	0.003608	0.18%
QC value within limits for Cd 226.502 A Recovery = 102.46%								
Ce 418.660 At	-420.7	-0.002633	mg/L	0.0002606	-0.002633	mg/L	0.0002606	9.90%
Co 228.616 At	33272.9	2.03772	mg/L	0.005327	2.03772	mg/L	0.005327	0.26%
QC value within limits for Co 228.616 A Recovery = 101.89%								
Cr 267.716 At	76891.3	2.04443	mg/L	0.005111	2.04443	mg/L	0.005111	0.25%
QC value within limits for Cr 267.716 A Recovery = 102.22%								
Cu 324.752 At	337299.5	2.00992	mg/L	0.008053	2.00992	mg/L	0.008053	0.40%
QC value within limits for Cu 324.752 A Recovery = 100.50%								
Fe 273.955 Rt	1167.3	2.04499	mg/L	0.029051	2.04499	mg/L	0.029051	1.42%
QC value within limits for Fe 273.955 R Recovery = 102.25%								
Ga 417.206 At	326458.1	3.86230	mg/L	0.026787	3.86230	mg/L	0.026787	0.69%
QC value within limits for Ga 417.206 A Recovery = 96.56%								
K 766.490 Rt	49238.6	19.8537	mg/L	0.02841	19.8537	mg/L	0.02841	0.14%
QC value within limits for K 766.490 R Recovery = 99.27%								
La 379.478 At	859534.2	4.02690	mg/L	0.003788	4.02690	mg/L	0.003788	0.09%
QC value within limits for La 379.478 A Recovery = 100.67%								
Li 670.784 Rt	418061.2	3.87613	mg/L	0.021791	3.87613	mg/L	0.021791	0.56%
QC value within limits for Li 670.784 R Recovery = 96.90%								
Mg 279.077 Rt	1008.2	2.05942	mg/L	0.021617	2.05942	mg/L	0.021617	1.05%
QC value within limits for Mg 279.077 R Recovery = 102.97%								
Mn 260.568 Rt	25724.4	1.99024	mg/L	0.024037	1.99024	mg/L	0.024037	1.21%
QC value within limits for Mn 260.568 R Recovery = 99.51%								
Mo 202.031 At	16130.5	2.04707	mg/L	0.000908	2.04707	mg/L	0.000908	0.04%
QC value within limits for Mo 202.031 A Recovery = 102.35%								
Na 589.592 Rt	142632.9	20.1309	mg/L	0.41313	20.1309	mg/L	0.41313	2.05%
QC value within limits for Na 589.592 R Recovery = 100.65%								
Ni 232.003 At	20215.9	2.01695	mg/L	0.001663	2.01695	mg/L	0.001663	0.08%
QC value within limits for Ni 232.003 A Recovery = 100.85%								
P 213.617 At	14314.5	9.34289	mg/L	0.030587	9.34289	mg/L	0.030587	0.33%
QC value less than the lower limit for P 213.617 A Recovery = 93.43%								
Pb 220.353 At	7191.7	2.05252	mg/L	0.009624	2.05252	mg/L	0.009624	0.47%
QC value within limits for Pb 220.353 A Recovery = 102.63%								
Sb 206.836 At	3314.8	2.03645	mg/L	0.007886	2.03645	mg/L	0.007886	0.39%
QC value within limits for Sb 206.836 A Recovery = 101.82%								
Sc 361.383 At	1214441.6	1.00792	mg/L	0.000426	1.00792	mg/L	0.000426	0.04%
QC value within limits for Sc 361.383 A Recovery = 100.79%								
Se 196.026 At	860.8	1.99390	mg/L	0.003079	1.99390	mg/L	0.003079	0.15%
QC value within limits for Se 196.026 A Recovery = 99.70%								
Si 251.611 Rt	13626.3	10.0531	mg/L	0.11230	10.0531	mg/L	0.11230	1.12%
QC value within limits for Si 251.611 R Recovery = 100.53%								
SIO2 251.611 Rt	13626.3	21.5150	mg/L	0.24033	21.5150	mg/L	0.24033	1.12%

QC value within limits for SIO2 251.611 R Recovery = 100.54%

Sn 189.927 A†	9778.2	4.02431 mg/L	0.023128	4.02431 mg/L	0.023128	0.57%

QC value within limits for Sn 189.927 A Recovery = 100.61%

Sr 421.552 R†	1392531.3	1.95442 mg/L	0.012645	1.95442 mg/L	0.012645	0.65%

QC value within limits for Sr 421.552 R Recovery = 97.72%

Ti 336.121 A†	562357.1	2.02606 mg/L	0.001280	2.02606 mg/L	0.001280	0.06%

QC value within limits for Ti 336.121 A Recovery = 101.30%

Tl 190.801 A†	1514.6	2.04060 mg/L	0.001296	2.04060 mg/L	0.001296	0.06%

QC value within limits for Tl 190.801 A Recovery = 102.03%

U 385.958 A†	19416.3	1.01578 mg/L	0.003689	1.01578 mg/L	0.003689	0.36%
V 292.402 A†	166070.7	2.06648 mg/L	0.005422	2.06648 mg/L	0.005422	0.26%

QC value within limits for V 292.402 A Recovery = 103.32%

Zn 206.200 A†	18206.9	2.05740 mg/L	0.002374	2.05740 mg/L	0.002374	0.12%

QC value within limits for Zn 206.200 A Recovery = 102.87%

QC Failed. Continue with analysis.

Sequence No.: 8
Sample ID: ICB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 1
Date Collected: 4/27/2009 7:53:28 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ICB

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	124473.1	99.4954	%	0.38690				0.39%
Lu 261.542 A	2373071.3	99.8845	%	0.30134				0.30%
Ag 328.068 At	-15.0	-0.000110	mg/L	0.0000431	-0.000110	mg/L	0.0000431	39.04%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	4.4	0.003627	mg/L	0.0031298	0.003627	mg/L	0.0031298	86.30%
QC value within limits for Al 308.215 R Recovery = Not calculated								
As 188.979 At	-1.0	-0.001283	mg/L	0.0019478	-0.001283	mg/L	0.0019478	151.80%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	14.9	0.007973	mg/L	0.0019412	0.007973	mg/L	0.0019412	24.35%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	0.3	0.000007	mg/L	0.0000227	0.000007	mg/L	0.0000227	313.00%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	10.9	0.000082	mg/L	0.0000131	0.000082	mg/L	0.0000131	16.05%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	10.2	0.009485	mg/L	0.0021589	0.009485	mg/L	0.0021589	22.76%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	1.9	0.000558	mg/L	0.0007280	0.000558	mg/L	0.0007280	130.41%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	10.3	0.000320	mg/L	0.0000769	0.000320	mg/L	0.0000769	24.00%
QC value within limits for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	-1.1	-0.000015	mg/L	0.0003001	-0.000015	mg/L	0.0003001	>999.9%
Co 228.616 At	-0.3	-0.000018	mg/L	0.0000388	-0.000018	mg/L	0.0000388	215.36%
QC value within limits for Co 228.616 A Recovery = Not calculated								
Cr 267.716 At	-4.5	-0.000119	mg/L	0.0000593	-0.000119	mg/L	0.0000593	49.66%
QC value within limits for Cr 267.716 A Recovery = Not calculated								
Cu 324.752 At	-128.1	-0.000763	mg/L	0.0000023	-0.000763	mg/L	0.0000023	0.30%
QC value within limits for Cu 324.752 A Recovery = Not calculated								
Fe 273.955 Rt	-2.6	-0.004641	mg/L	0.0013227	-0.004641	mg/L	0.0013227	28.50%
QC value within limits for Fe 273.955 R Recovery = Not calculated								
Ga 417.206 At	16.4	0.000196	mg/L	0.0000633	0.000196	mg/L	0.0000633	32.40%
QC value within limits for Ga 417.206 A Recovery = Not calculated								
K 766.490 Rt	8.9	0.003606	mg/L	0.0017627	0.003606	mg/L	0.0017627	48.88%
QC value within limits for K 766.490 R Recovery = Not calculated								
La 379.478 At	7.1	0.000034	mg/L	0.0000193	0.000034	mg/L	0.0000193	56.21%
QC value within limits for La 379.478 A Recovery = Not calculated								
Li 670.784 Rt	3.3	0.000030	mg/L	0.0001480	0.000030	mg/L	0.0001480	487.60%
QC value within limits for Li 670.784 R Recovery = Not calculated								
Mg 279.077 Rt	0.9	0.001886	mg/L	0.0034007	0.001886	mg/L	0.0034007	180.29%
QC value within limits for Mg 279.077 R Recovery = Not calculated								
Mn 260.568 Rt	-0.2	-0.000016	mg/L	0.0001394	-0.000016	mg/L	0.0001394	864.46%
QC value within limits for Mn 260.568 R Recovery = Not calculated								
Mo 202.031 At	7.8	0.000983	mg/L	0.0002464	0.000983	mg/L	0.0002464	25.07%
QC value within limits for Mo 202.031 A Recovery = Not calculated								
Na 589.592 Rt	-301.6	-0.042568	mg/L	0.0009895	-0.042568	mg/L	0.0009895	2.32%
QC value within limits for Na 589.592 R Recovery = Not calculated								
Ni 232.003 At	-4.2	-0.000432	mg/L	0.0003591	-0.000432	mg/L	0.0003591	83.12%
QC value within limits for Ni 232.003 A Recovery = Not calculated								
P 213.617 At	-0.9	-0.000551	mg/L	0.0007553	-0.000551	mg/L	0.0007553	137.05%
QC value within limits for P 213.617 A Recovery = Not calculated								
Pb 220.353 At	-2.3	-0.000650	mg/L	0.0006493	-0.000650	mg/L	0.0006493	99.87%
QC value within limits for Pb 220.353 A Recovery = Not calculated								
Sb 206.836 At	1.0	0.000593	mg/L	0.0017260	0.000593	mg/L	0.0017260	291.20%
QC value within limits for Sb 206.836 A Recovery = Not calculated								
Sc 361.383 At	68.8	0.000057	mg/L	0.0000012	0.000057	mg/L	0.0000012	2.11%
QC value within limits for Sc 361.383 A Recovery = Not calculated								
Se 196.026 At	-1.0	-0.002335	mg/L	0.0009085	-0.002335	mg/L	0.0009085	38.90%
QC value within limits for Se 196.026 A Recovery = Not calculated								
Si 251.611 Rt	7.6	0.005667	mg/L	0.0009831	0.005667	mg/L	0.0009831	17.35%
QC value within limits for Si 251.611 R Recovery = Not calculated								
SIO2 251.611 Rt	7.6	0.012127	mg/L	0.0021042	0.012127	mg/L	0.0021042	17.35%

QC value within limits for SIO2 251.611 R Recovery = Not calculated						
Sn 189.927 At	1.1	0.000435 mg/L	0.0010122	0.000435 mg/L	0.0010122	232.91%
QC value within limits for Sn 189.927 A Recovery = Not calculated						
Sr 421.552 Rt	33.5	0.000047 mg/L	0.0000288	0.000047 mg/L	0.0000288	61.32%
QC value within limits for Sr 421.552 R Recovery = Not calculated						
Ti 336.121 At	35.3	0.000129 mg/L	0.0000334	0.000129 mg/L	0.0000334	25.92%
QC value within limits for Ti 336.121 A Recovery = Not calculated						
Tl 190.801 At	0.1	0.000172 mg/L	0.0013294	0.000172 mg/L	0.0013294	774.67%
QC value within limits for Tl 190.801 A Recovery = Not calculated						
U 385.958 At	-7.1	-0.000406 mg/L	0.0002541	-0.000406 mg/L	0.0002541	62.65%
V 292.402 At	-5.2	-0.000057 mg/L	0.0000442	-0.000057 mg/L	0.0000442	78.25%
QC value within limits for V 292.402 A Recovery = Not calculated						
Zn 206.200 At	-0.1	-0.000009 mg/L	0.0001475	-0.000009 mg/L	0.0001475	>999.9%
QC value within limits for Zn 206.200 A Recovery = Not calculated						
All analyte(s) passed QC.						

69

Sequence No.: 9
Sample ID: CRI
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 9
Date Collected: 4/27/2009 7:59:10 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CRI

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	121711.3	97.2878	%	0.01230				0.01%
Lu 261.542 A	2333244.7	98.2081	%	0.08128				0.08%
Ag 328.068 At	663.5	0.004881	mg/L	0.0000069	0.004881	mg/L	0.0000069	0.14%
QC value within limits for Ag 328.068 A Recovery = 97.62%								
Al 308.215 Rt	107.9	0.088942	mg/L	0.0006164	0.088942	mg/L	0.0006164	0.69%
QC value within limits for Al 308.215 R Recovery = 111.18%								
As 188.979 At	18.8	0.023222	mg/L	0.0052170	0.023222	mg/L	0.0052170	22.47%
QC value within limits for As 188.979 A Recovery = 92.89%								
B 249.677 Rt	84.7	0.045438	mg/L	0.0009639	0.045438	mg/L	0.0009639	2.12%
QC value within limits for B 249.677 R Recovery = 113.60%								
Ba 233.527 At	83.9	0.002117	mg/L	0.0000648	0.002117	mg/L	0.0000648	3.06%
QC value within limits for Ba 233.527 A Recovery = 105.84%								
Be 313.107 Rt	277.6	0.002080	mg/L	0.0000129	0.002080	mg/L	0.0000129	0.62%
QC value within limits for Be 313.107 R Recovery = 103.98%								
Bi 222.821 At	72.9	0.067813	mg/L	0.0007005	0.067813	mg/L	0.0007005	1.03%
QC value within limits for Bi 222.821 A Recovery = 113.02%								
Ca 315.887 Rt	153.0	0.043938	mg/L	0.0020357	0.043938	mg/L	0.0020357	4.63%
QC value within limits for Ca 315.887 R Recovery = 109.85%								
Cd 226.502 At	71.8	0.002224	mg/L	0.0001073	0.002224	mg/L	0.0001073	4.83%
QC value within limits for Cd 226.502 A Recovery = 111.19%								
Ce 418.660 At	11.6	0.000167	mg/L	0.0001613	0.000167	mg/L	0.0001613	96.52%
Co 228.616 At	103.0	0.006306	mg/L	0.0001507	0.006306	mg/L	0.0001507	2.39%
QC value within limits for Co 228.616 A Recovery = 105.10%								
Cr 267.716 At	227.9	0.006058	mg/L	0.0000335	0.006058	mg/L	0.0000335	0.55%
QC value within limits for Cr 267.716 A Recovery = 100.97%								
Cu 324.752 At	1546.7	0.009203	mg/L	0.0000556	0.009203	mg/L	0.0000556	0.60%
QC value within limits for Cu 324.752 A Recovery = 92.03%								
Fe 273.955 Rt	37.8	0.066671	mg/L	0.0000834	0.066671	mg/L	0.0000834	0.13%
QC value within limits for Fe 273.955 R Recovery = 111.12%								
Ga 417.206 At	1676.4	0.019834	mg/L	0.0000291	0.019834	mg/L	0.0000291	0.15%
QC value within limits for Ga 417.206 A Recovery = 99.17%								
K 766.490 Rt	1304.3	0.525894	mg/L	0.0026215	0.525894	mg/L	0.0026215	0.50%
QC value within limits for K 766.490 R Recovery = 105.18%								
La 379.478 At	919.2	0.004302	mg/L	0.0000537	0.004302	mg/L	0.0000537	1.25%
QC value within limits for La 379.478 A Recovery = 86.05%								
Li 670.784 Rt	2262.9	0.020981	mg/L	0.0000910	0.020981	mg/L	0.0000910	0.43%
QC value within limits for Li 670.784 R Recovery = 104.90%								
Mg 279.077 Rt	31.6	0.064327	mg/L	0.0031804	0.064327	mg/L	0.0031804	4.94%
QC value within limits for Mg 279.077 R Recovery = 107.21%								
Mn 260.568 Rt	53.4	0.004125	mg/L	0.0000077	0.004125	mg/L	0.0000077	0.19%
QC value within limits for Mn 260.568 R Recovery = 103.13%								
Mo 202.031 At	67.0	0.008520	mg/L	0.0000493	0.008520	mg/L	0.0000493	0.58%
QC value within limits for Mo 202.031 A Recovery = 106.50%								
Na 589.592 Rt	3509.2	0.495280	mg/L	0.0006333	0.495280	mg/L	0.0006333	0.13%
QC value within limits for Na 589.592 R Recovery = 99.06%								
Ni 232.003 At	95.6	0.009676	mg/L	0.0001649	0.009676	mg/L	0.0001649	1.70%
QC value within limits for Ni 232.003 A Recovery = 96.76%								
P 213.617 At	77.9	0.050920	mg/L	0.0029287	0.050920	mg/L	0.0029287	5.75%
QC value within limits for P 213.617 A Recovery = 101.84%								
Pb 220.353 At	25.7	0.007324	mg/L	0.0013285	0.007324	mg/L	0.0013285	18.14%
QC value within limits for Pb 220.353 A Recovery = 97.65%								
Sb 206.836 At	34.5	0.021235	mg/L	0.0002707	0.021235	mg/L	0.0002707	1.27%
QC value within limits for Sb 206.836 A Recovery = 106.18%								
Sc 361.383 At	2656.9	0.002205	mg/L	0.0000062	0.002205	mg/L	0.0000062	0.28%
QC value within limits for Sc 361.383 A Recovery = 110.26%								
Se 196.026 At	16.8	0.038677	mg/L	0.0035611	0.038677	mg/L	0.0035611	9.21%
QC value within limits for Se 196.026 A Recovery = 96.69%								
Si 251.611 Rt	122.4	0.090585	mg/L	0.0005250	0.090585	mg/L	0.0005250	0.58%
QC value within limits for Si 251.611 R Recovery = 113.23%								
SIO2 251.611 Rt	122.4	0.193857	mg/L	0.0011236	0.193857	mg/L	0.0011236	0.58%

70

QC value within limits for SIO2 251.611 R Recovery = 113.37%						
Sn 189.927 A†	128.4	0.052832 mg/L	0.0002464	0.052832 mg/L	0.0002464	0.47%
QC value within limits for Sn 189.927 A Recovery = 105.66%						
Sr 421.552 R†	3647.1	0.005118 mg/L	0.0000181	0.005118 mg/L	0.0000181	0.35%
QC value within limits for Sr 421.552 R Recovery = 102.37%						
Ti 336.121 A†	1427.6	0.005213 mg/L	0.0000088	0.005213 mg/L	0.0000088	0.17%
QC value within limits for Ti 336.121 A Recovery = 104.26%						
Tl 190.801 A†	11.4	0.015361 mg/L	0.0012141	0.015361 mg/L	0.0012141	7.90%
QC value within limits for Tl 190.801 A Recovery = 102.41%						
U 385.958 A†	378.5	0.021438 mg/L	0.0005910	0.021438 mg/L	0.0005910	2.76%
V 292.402 A†	401.4	0.005075 mg/L	0.0000056	0.005075 mg/L	0.0000056	0.11%
QC value within limits for V 292.402 A Recovery = 101.50%						
Zn 206.200 A†	91.4	0.010328 mg/L	0.0000476	0.010328 mg/L	0.0000476	0.46%
QC value within limits for Zn 206.200 A Recovery = 103.28%						

All analyte(s) passed QC.

71

Sequence No.: 10
Sample ID: ICSA
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 7
Date Collected: 4/27/2009 8:04:56 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ICSA

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	120150.3	96.0401	%	0.39556				0.41%
Lu 261.542 A	2142385.0	90.1747	%	0.05244				0.06%
Ag 328.068 At	-1274.7	0.001290	mg/L	0.0001344	0.001290	mg/L	0.0001344	10.42%
Al 308.215 Rt	613804.6	509.093	mg/L	1.7709	509.093	mg/L	1.7709	0.35%
QC value within limits for Al 308.215 R Recovery = 101.82%								
As 188.979 At	-4.8	0.010545	mg/L	0.0019738	0.010545	mg/L	0.0019738	18.72%
B 249.677 Rt	-5.3	0.016203	mg/L	0.0013718	0.016203	mg/L	0.0013718	8.47%
Ba 233.527 At	407.8	0.001986	mg/L	0.0000380	0.001986	mg/L	0.0000380	1.91%
Be 313.107 Rt	61.4	0.000238	mg/L	0.0000560	0.000238	mg/L	0.0000560	23.57%
Bi 222.821 At	403.0	0.078887	mg/L	0.0053491	0.078887	mg/L	0.0053491	6.78%
Ca 315.887 Rt	1659703.8	478.369	mg/L	0.9643	478.369	mg/L	0.9643	0.20%
QC value within limits for Ca 315.887 R Recovery = 95.67%								
Cd 226.502 At	1284.8	0.008930	mg/L	0.0009098	0.008930	mg/L	0.0009098	10.19%
Ce 418.660 At	-1420.1	-0.019626	mg/L	0.0007859	-0.019626	mg/L	0.0007859	4.00%
Co 228.616 At	422.9	-0.001060	mg/L	0.0004445	-0.001060	mg/L	0.0004445	41.92%
Cr 267.716 At	359716.2	9.56031	mg/L	0.018196	9.56031	mg/L	0.018196	0.19%
QC value within limits for Cr 267.716 A Recovery = 95.60%								
Cu 324.752 At	1867237.7	11.1311	mg/L	0.02835	11.1311	mg/L	0.02835	0.25%
QC value within limits for Cu 324.752 A Recovery = 111.31%								
Fe 273.955 Rt	104273.1	184.070	mg/L	1.0224	184.070	mg/L	1.0224	0.56%
QC value within limits for Fe 273.955 R Recovery = 92.04%								
Ga 417.206 At	6690.2	-0.013616	mg/L	0.0018599	-0.013616	mg/L	0.0018599	13.66%
K 766.490 Rt	28.2	0.011241	mg/L	0.0011320	0.011241	mg/L	0.0011320	10.07%
La 379.478 At	12463.3	0.011268	mg/L	0.0001292	0.011268	mg/L	0.0001292	1.15%
Li 670.784 Rt	148.8	0.001380	mg/L	0.0000398	0.001380	mg/L	0.0000398	2.88%
Mg 279.077 Rt	250296.6	508.012	mg/L	1.2820	508.012	mg/L	1.2820	0.25%
QC value within limits for Mg 279.077 R Recovery = 101.60%								
Mn 260.568 Rt	121968.5	9.41549	mg/L	0.005657	9.41549	mg/L	0.005657	0.06%
QC value within limits for Mn 260.568 R Recovery = 94.15%								
Mo 202.031 At	70.4	0.003483	mg/L	0.0000025	0.003483	mg/L	0.0000025	0.07%
Na 589.592 Rt	-215.5	-0.030421	mg/L	0.0003321	-0.030421	mg/L	0.0003321	1.09%
Ni 232.003 At	98801.0	10.0614	mg/L	0.03923	10.0614	mg/L	0.03923	0.39%
QC value within limits for Ni 232.003 A Recovery = 100.61%								
P 213.617 At	38.8	-0.115279	mg/L	0.0077136	-0.115279	mg/L	0.0077136	6.69%
Pb 220.353 At	-50.8	0.007879	mg/L	0.0033499	0.007879	mg/L	0.0033499	42.52%
Sb 206.836 At	127.1	0.016416	mg/L	0.0057697	0.016416	mg/L	0.0057697	35.15%
Sc 361.383 At	-483.1	-0.000821	mg/L	0.0000181	-0.000821	mg/L	0.0000181	2.20%
Se 196.026 At	13.0	0.000281	mg/L	0.0061513	0.000281	mg/L	0.0061513	>999.9%
Si 251.611 Rt	187.2	-0.096100	mg/L	0.0063006	-0.096100	mg/L	0.0063006	6.56%
SIO2 251.611 Rt	187.2	-0.203954	mg/L	0.0134872	-0.203954	mg/L	0.0134872	6.61%
Sn 189.927 At	-50.3	-0.007680	mg/L	0.0011771	-0.007680	mg/L	0.0011771	15.33%
Sr 421.552 Rt	2629.8	-0.002193	mg/L	0.0000245	-0.002193	mg/L	0.0000245	1.12%
Ti 336.121 At	2484109.2	9.89125	mg/L	0.001409	9.89125	mg/L	0.001409	0.01%
QC value within limits for Ti 336.121 A Recovery = 98.91%								
Tl 190.801 At	-0.2	0.015361	mg/L	0.0019436	0.015361	mg/L	0.0019436	12.65%
U 385.958 At	10768.3	0.134955	mg/L	0.0023610	0.134955	mg/L	0.0023610	1.75%
V 292.402 At	805157.1	9.91370	mg/L	0.006053	9.91370	mg/L	0.006053	0.06%
QC value within limits for V 292.402 A Recovery = 99.14%								
Zn 206.200 At	153.1	0.008415	mg/L	0.0000111	0.008415	mg/L	0.0000111	0.13%

All analyte(s) passed QC.

Sequence No.: 11
Sample ID: ICSAB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 8
Date Collected: 4/27/2009 8:11:15 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ICSAB

Analyte	Mean Corrected Intensity	Calib. Conc.	Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	121463.9	97.0901	%	0.33729				0.35%
Lu 261.542 A	2149774.3	90.4857	%	0.28873				0.32%
Ag 328.068 At	70667.2	0.530488	mg/L	0.0036041	0.530488	mg/L	0.0036041	0.68%
QC value within limits for Ag 328.068 A Recovery = 106.10%								
Al 308.215 Rt	607018.6	503.678	mg/L	2.5097	503.678	mg/L	2.5097	0.50%
QC value within limits for Al 308.215 R Recovery = 100.74%								
As 188.979 At	396.8	0.492927	mg/L	0.0128692	0.492927	mg/L	0.0128692	2.61%
QC value within limits for As 188.979 A Recovery = 98.59%								
B 249.677 Rt	27.8	0.021076	mg/L	0.0017980	0.021076	mg/L	0.0017980	8.53%
Ba 233.527 At	19890.2	0.496400	mg/L	0.0021853	0.496400	mg/L	0.0021853	0.44%
QC value within limits for Ba 233.527 A Recovery = 99.28%								
Be 313.107 Rt	62709.3	0.469733	mg/L	0.0017990	0.469733	mg/L	0.0017990	0.38%
QC value within limits for Be 313.107 R Recovery = 93.95%								
Bi 222.821 At	188.8	0.046916	mg/L	0.0035780	0.046916	mg/L	0.0035780	7.63%
Ca 315.887 Rt	1649812.7	475.499	mg/L	1.6823	475.499	mg/L	1.6823	0.35%
QC value within limits for Ca 315.887 R Recovery = 95.10%								
Cd 226.502 At	15720.8	0.452808	mg/L	0.0027941	0.452808	mg/L	0.0027941	0.62%
QC value within limits for Cd 226.502 A Recovery = 90.56%								
Ce 418.660 At	453.4	0.005063	mg/L	0.0002874	0.005063	mg/L	0.0002874	5.68%
Co 228.616 At	7022.7	0.427184	mg/L	0.0026817	0.427184	mg/L	0.0026817	0.63%
QC value within limits for Co 228.616 A Recovery = 85.44%								
Cr 267.716 At	17651.2	0.465413	mg/L	0.0030920	0.465413	mg/L	0.0030920	0.66%
QC value within limits for Cr 267.716 A Recovery = 93.08%								
Cu 324.752 At	94277.4	0.560560	mg/L	0.0071024	0.560560	mg/L	0.0071024	1.27%
QC value within limits for Cu 324.752 A Recovery = 112.11%								
Fe 273.955 Rt	102616.2	181.215	mg/L	0.3792	181.215	mg/L	0.3792	0.21%
QC value within limits for Fe 273.955 R Recovery = 90.61%								
Ga 417.206 At	3003.9	0.000830	mg/L	0.0006350	0.000830	mg/L	0.0006350	76.48%
K 766.490 Rt	-30.4	-0.012195	mg/L	0.0050872	-0.012195	mg/L	0.0050872	41.71%
La 379.478 At	7695.4	0.009158	mg/L	0.0006124	0.009158	mg/L	0.0006124	6.69%
Li 670.784 Rt	-48.4	-0.000449	mg/L	0.0001985	-0.000449	mg/L	0.0001985	44.22%
Mg 279.077 Rt	252316.7	512.088	mg/L	2.7970	512.088	mg/L	2.7970	0.55%
QC value within limits for Mg 279.077 R Recovery = 102.42%								
Mn 260.568 Rt	6183.1	0.450856	mg/L	0.0050853	0.450856	mg/L	0.0050853	1.13%
QC value within limits for Mn 260.568 R Recovery = 90.17%								
Mo 202.031 At	52.8	0.001567	mg/L	0.0005744	0.001567	mg/L	0.0005744	36.65%
Na 589.592 Rt	-266.9	-0.037671	mg/L	0.0006791	-0.037671	mg/L	0.0006791	1.80%
Ni 232.003 At	3229.7	0.485289	mg/L	0.0038940	0.485289	mg/L	0.0038940	0.80%
QC value within limits for Ni 232.003 A Recovery = 97.06%								
P 213.617 At	-177.4	-0.029168	mg/L	0.0008999	-0.029168	mg/L	0.0008999	3.09%
Pb 220.353 At	1560.0	0.471275	mg/L	0.0034299	0.471275	mg/L	0.0034299	0.73%
QC value within limits for Pb 220.353 A Recovery = 94.25%								
Sb 206.836 At	780.8	0.488887	mg/L	0.0082851	0.488887	mg/L	0.0082851	1.69%
QC value within limits for Sb 206.836 A Recovery = 97.78%								
Sc 361.383 At	-504.0	-0.000448	mg/L	0.0000090	-0.000448	mg/L	0.0000090	2.01%
Se 196.026 At	223.5	0.492712	mg/L	0.0078119	0.492712	mg/L	0.0078119	1.59%
QC value within limits for Se 196.026 A Recovery = 98.54%								
Si 251.611 Rt	78.8	-0.036634	mg/L	0.0001328	-0.036634	mg/L	0.0001328	0.36%
SIO2 251.611 Rt	78.8	-0.076832	mg/L	0.0002927	-0.076832	mg/L	0.0002927	0.38%
Sn 189.927 At	-45.0	-0.005528	mg/L	0.0023805	-0.005528	mg/L	0.0023805	43.07%
Sr 421.552 Rt	2674.2	-0.002095	mg/L	0.0000036	-0.002095	mg/L	0.0000036	0.17%
Ti 336.121 At	4862.3	0.015704	mg/L	0.0001468	0.015704	mg/L	0.0001468	0.93%
Tl 190.801 At	324.5	0.441732	mg/L	0.0023354	0.441732	mg/L	0.0023354	0.53%
QC value within limits for Tl 190.801 A Recovery = 88.35%								
U 385.958 At	18417.0	0.574068	mg/L	0.0039831	0.574068	mg/L	0.0039831	0.69%
V 292.402 At	40938.5	0.494193	mg/L	0.0032689	0.494193	mg/L	0.0032689	0.66%
QC value within limits for V 292.402 A Recovery = 98.84%								
Zn 206.200 At	3967.9	0.446387	mg/L	0.0016777	0.446387	mg/L	0.0016777	0.38%
QC value within limits for Zn 206.200 A Recovery = 89.28%								

All analyte(s) passed QC.

73

Sequence No.: 12
Sample ID: CCV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 6
Date Collected: 4/27/2009 8:17:31 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCV

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	124684.9	99.6648	%	0.04748				0.05%
Lu 261.542 A	2362892.6	99.4560	%	0.69583				0.70%
Ag 328.068 At	274208.1	2.01906	mg/L	0.016724	2.01906	mg/L	0.016724	0.83%
QC value within limits for Ag 328.068 A Recovery = 100.95%								
Al 308.215 Rt	2645.4	2.09611	mg/L	0.003593	2.09611	mg/L	0.003593	0.17%
QC value within limits for Al 308.215 R Recovery = 104.81%								
As 188.979 At	1747.8	2.04580	mg/L	0.013026	2.04580	mg/L	0.013026	0.64%
QC value within limits for As 188.979 A Recovery = 102.29%								
B 249.677 Rt	3816.6	2.04694	mg/L	0.007172	2.04694	mg/L	0.007172	0.35%
QC value within limits for B 249.677 R Recovery = 102.35%								
Ba 233.527 At	80995.0	2.04473	mg/L	0.016338	2.04473	mg/L	0.016338	0.80%
QC value within limits for Ba 233.527 A Recovery = 102.24%								
Be 313.107 Rt	267908.7	2.00631	mg/L	0.000195	2.00631	mg/L	0.000195	0.01%
QC value within limits for Be 313.107 R Recovery = 100.32%								
Bi 222.821 At	4164.3	3.74370	mg/L	0.037114	3.74370	mg/L	0.037114	0.99%
QC value within limits for Bi 222.821 A Recovery = 93.59%								
Ca 315.887 Rt	7293.2	2.09074	mg/L	0.014148	2.09074	mg/L	0.014148	0.68%
QC value within limits for Ca 315.887 R Recovery = 104.54%								
Cd 226.502 At	65892.9	2.04427	mg/L	0.018617	2.04427	mg/L	0.018617	0.91%
QC value within limits for Cd 226.502 A Recovery = 102.21%								
Ce 418.660 At	-446.3	-0.003064	mg/L	0.0003046	-0.003064	mg/L	0.0003046	9.94%
QC value within limits for Ce 418.660 A Recovery = Not calculated								
Co 228.616 At	33088.1	2.02639	mg/L	0.017234	2.02639	mg/L	0.017234	0.85%
QC value within limits for Co 228.616 A Recovery = 101.32%								
Cr 267.716 At	76671.2	2.03858	mg/L	0.016873	2.03858	mg/L	0.016873	0.83%
QC value within limits for Cr 267.716 A Recovery = 101.93%								
Cu 324.752 At	336196.2	2.00335	mg/L	0.001102	2.00335	mg/L	0.001102	0.05%
QC value within limits for Cu 324.752 A Recovery = 100.17%								
Fe 273.955 Rt	1191.5	2.08774	mg/L	0.001135	2.08774	mg/L	0.001135	0.05%
QC value within limits for Fe 273.955 R Recovery = 104.39%								
Ga 417.206 At	323574.6	3.82812	mg/L	0.019858	3.82812	mg/L	0.019858	0.52%
QC value within limits for Ga 417.206 A Recovery = 95.70%								
K 766.490 Rt	49146.1	19.8164	mg/L	0.03231	19.8164	mg/L	0.03231	0.16%
QC value within limits for K 766.490 R Recovery = 99.08%								
La 379.478 At	855648.5	4.00869	mg/L	0.000702	4.00869	mg/L	0.000702	0.02%
QC value within limits for La 379.478 A Recovery = 100.22%								
Li 670.784 Rt	416320.4	3.85999	mg/L	0.026946	3.85999	mg/L	0.026946	0.70%
QC value within limits for Li 670.784 R Recovery = 96.50%								
Mg 279.077 Rt	1036.2	2.11607	mg/L	0.009516	2.11607	mg/L	0.009516	0.45%
QC value within limits for Mg 279.077 R Recovery = 105.80%								
Mn 260.568 Rt	25915.9	2.00507	mg/L	0.006086	2.00507	mg/L	0.006086	0.30%
QC value within limits for Mn 260.568 R Recovery = 100.25%								
Mo 202.031 At	16020.5	2.03310	mg/L	0.018625	2.03310	mg/L	0.018625	0.92%
QC value within limits for Mo 202.031 A Recovery = 101.66%								
Na 589.592 Rt	142763.5	20.1494	mg/L	0.35306	20.1494	mg/L	0.35306	1.75%
QC value within limits for Na 589.592 R Recovery = 100.75%								
Ni 232.003 At	20048.6	2.00008	mg/L	0.016011	2.00008	mg/L	0.016011	0.80%
QC value within limits for Ni 232.003 A Recovery = 100.00%								
P 213.617 At	14182.7	9.25671	mg/L	0.064668	9.25671	mg/L	0.064668	0.70%
QC value within limits for P 213.617 A Recovery = 92.57%								
Pb 220.353 At	7136.2	2.03669	mg/L	0.014812	2.03669	mg/L	0.014812	0.73%
QC value within limits for Pb 220.353 A Recovery = 101.83%								
Sb 206.836 At	3275.4	2.01223	mg/L	0.013795	2.01223	mg/L	0.013795	0.69%
QC value within limits for Sb 206.836 A Recovery = 100.61%								
Sc 361.383 At	1206619.3	1.00143	mg/L	0.000413	1.00143	mg/L	0.000413	0.04%
QC value within limits for Sc 361.383 A Recovery = 100.14%								
Se 196.026 At	850.8	1.97074	mg/L	0.018930	1.97074	mg/L	0.018930	0.96%
QC value within limits for Se 196.026 A Recovery = 98.54%								
Si 251.611 Rt	13695.0	10.1050	mg/L	0.03798	10.1050	mg/L	0.03798	0.38%
QC value within limits for Si 251.611 R Recovery = 101.05%								

SIO2 251.611 Rt	13695.0	21.6262	mg/L	0.08126	21.6262	mg/L	0.08126	0.38%
QC value within limits for SIO2 251.611 R Recovery = 101.06%								
Sn 189.927 At	9723.1	4.00162	mg/L	0.019224	4.00162	mg/L	0.019224	0.48%
QC value within limits for Sn 189.927 A Recovery = 100.04%								
Sr 421.552 Rt	1393147.2	1.95528	mg/L	0.007651	1.95528	mg/L	0.007651	0.39%
QC value within limits for Sr 421.552 R Recovery = 97.76%								
Ti 336.121 At	560412.2	2.01969	mg/L	0.000480	2.01969	mg/L	0.000480	0.02%
QC value within limits for Ti 336.121 A Recovery = 100.98%								
Tl 190.801 At	1496.5	2.01624	mg/L	0.018813	2.01624	mg/L	0.018813	0.93%
QC value within limits for Tl 190.801 A Recovery = 100.81%								
U 385.958 At	19168.3	1.00199	mg/L	0.011653	1.00199	mg/L	0.011653	1.16%
V 292.402 At	164967.2	2.05273	mg/L	0.018406	2.05273	mg/L	0.018406	0.90%
QC value within limits for V 292.402 A Recovery = 102.64%								
Zn 206.200 At	18198.8	2.05649	mg/L	0.013239	2.05649	mg/L	0.013239	0.64%
QC value within limits for Zn 206.200 A Recovery = 102.82%								

All analyte(s) passed QC.

75

Sequence No.: 13
Sample ID: CCB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 1
Date Collected: 4/27/2009 8:23:30 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCB

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	122640.1	98.0303	%	0.42353				0.43%
Lu 261.542 A	2370354.9	99.7701	%	0.31464				0.32%
Ag 328.068 At	-1.0	-0.000008	mg/L	0.0000885	-0.000008	mg/L	0.0000885	>999.9%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	5.2	0.004293	mg/L	0.0035651	0.004293	mg/L	0.0035651	83.05%
QC value within limits for Al 308.215 R Recovery = Not calculated								
As 188.979 At	-1.8	-0.002299	mg/L	0.0008862	-0.002299	mg/L	0.0008862	38.55%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	11.9	0.006397	mg/L	0.0007505	0.006397	mg/L	0.0007505	11.73%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	2.7	0.000068	mg/L	0.0000868	0.000068	mg/L	0.0000868	126.90%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	16.5	0.000123	mg/L	0.0000215	0.000123	mg/L	0.0000215	17.46%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	8.7	0.008176	mg/L	0.0000676	0.008176	mg/L	0.0000676	0.83%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	12.5	0.003610	mg/L	0.0006084	0.003610	mg/L	0.0006084	16.85%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	9.7	0.000300	mg/L	0.0000584	0.000300	mg/L	0.0000584	19.47%
QC value within limits for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	2.0	0.000035	mg/L	0.0000657	0.000035	mg/L	0.0000657	188.42%
Co 228.616 At	2.7	0.000164	mg/L	0.0002953	0.000164	mg/L	0.0002953	179.93%
QC value within limits for Co 228.616 A Recovery = Not calculated								
Cr 267.716 At	-2.4	-0.000064	mg/L	0.0001730	-0.000064	mg/L	0.0001730	271.88%
QC value within limits for Cr 267.716 A Recovery = Not calculated								
Cu 324.752 At	322.3	0.001920	mg/L	0.0000960	0.001920	mg/L	0.0000960	5.00%
QC value within limits for Cu 324.752 A Recovery = Not calculated								
Fe 273.955 Rt	-0.1	-0.000119	mg/L	0.0018059	-0.000119	mg/L	0.0018059	>999.9%
QC value within limits for Fe 273.955 R Recovery = Not calculated								
Ga 417.206 At	18.4	0.000217	mg/L	0.0000447	0.000217	mg/L	0.0000447	20.64%
QC value within limits for Ga 417.206 A Recovery = Not calculated								
K 766.490 Rt	17.9	0.007209	mg/L	0.0023973	0.007209	mg/L	0.0023973	33.26%
QC value within limits for K 766.490 R Recovery = Not calculated								
La 379.478 At	29.4	0.000138	mg/L	0.0001298	0.000138	mg/L	0.0001298	94.11%
QC value within limits for La 379.478 A Recovery = Not calculated								
Li 670.784 Rt	5.0	0.000046	mg/L	0.0000344	0.000046	mg/L	0.0000344	74.77%
QC value within limits for Li 670.784 R Recovery = Not calculated								
Mg 279.077 Rt	1.6	0.003276	mg/L	0.0056004	0.003276	mg/L	0.0056004	170.96%
QC value within limits for Mg 279.077 R Recovery = Not calculated								
Mn 260.568 Rt	4.2	0.000322	mg/L	0.0000288	0.000322	mg/L	0.0000288	8.95%
QC value within limits for Mn 260.568 R Recovery = Not calculated								
Mo 202.031 At	8.3	0.001059	mg/L	0.0002057	0.001059	mg/L	0.0002057	19.43%
QC value within limits for Mo 202.031 A Recovery = Not calculated								
Na 589.592 Rt	-351.8	-0.049655	mg/L	0.0002008	-0.049655	mg/L	0.0002008	0.40%
QC value within limits for Na 589.592 R Recovery = Not calculated								
Ni 232.003 At	1.2	0.000125	mg/L	0.0000424	0.000125	mg/L	0.0000424	33.90%
QC value within limits for Ni 232.003 A Recovery = Not calculated								
P 213.617 At	2.7	0.001700	mg/L	0.0015487	0.001700	mg/L	0.0015487	91.12%
QC value within limits for P 213.617 A Recovery = Not calculated								
Pb 220.353 At	-3.9	-0.001123	mg/L	0.0012957	-0.001123	mg/L	0.0012957	115.33%
QC value within limits for Pb 220.353 A Recovery = Not calculated								
Sb 206.836 At	2.4	0.001454	mg/L	0.0004822	0.001454	mg/L	0.0004822	33.16%
QC value within limits for Sb 206.836 A Recovery = Not calculated								
Sc 361.383 At	94.8	0.000079	mg/L	0.0000067	0.000079	mg/L	0.0000067	8.46%
QC value within limits for Sc 361.383 A Recovery = Not calculated								
Se 196.026 At	-1.1	-0.002634	mg/L	0.0025050	-0.002634	mg/L	0.0025050	95.09%
QC value within limits for Se 196.026 A Recovery = Not calculated								
Si 251.611 Rt	4.5	0.003343	mg/L	0.0017419	0.003343	mg/L	0.0017419	52.11%
QC value within limits for Si 251.611 R Recovery = Not calculated								
SIO2 251.611 Rt	4.5	0.007154	mg/L	0.0037279	0.007154	mg/L	0.0037279	52.11%

QC value within limits for SIO2 251.611 R Recovery = Not calculated						
Sn 189.927 At	2.0	0.000842 mg/L	0.0010254	0.000842 mg/L	0.0010254	121.84%
QC value within limits for Sn 189.927 A Recovery = Not calculated						
Sr 421.552 Rt	61.1	0.000086 mg/L	0.0000424	0.000086 mg/L	0.0000424	49.49%
QC value within limits for Sr 421.552 R Recovery = Not calculated						
Ti 336.121 At	27.4	0.000092 mg/L	0.0000382	0.000092 mg/L	0.0000382	41.42%
QC value within limits for Ti 336.121 A Recovery = Not calculated						
Tl 190.801 At	0.5	0.000715 mg/L	0.0008362	0.000715 mg/L	0.0008362	116.89%
QC value within limits for Tl 190.801 A Recovery = Not calculated						
U 385.958 At	3.5	0.000197 mg/L	0.0009910	0.000197 mg/L	0.0009910	502.17%
V 292.402 At	-3.5	-0.000033 mg/L	0.0000144	-0.000033 mg/L	0.0000144	43.53%
QC value within limits for V 292.402 A Recovery = Not calculated						
Zn 206.200 At	0.3	0.000031 mg/L	0.0000665	0.000031 mg/L	0.0000665	212.87%
QC value within limits for Zn 206.200 A Recovery = Not calculated						

All analyte(s) passed QC.

T1

==========

Analysis Begun

Start Time: 4/27/2009 8:41:02 AM Plasma On Time: 4/27/2009 6:27:37 AM
Logged In Analyst: Optima5 Technique: ICP Continuous
Spectrometer Model: Optima 5300 DV, S/N 077N5011902 Autosampler Model: AS-93plus

Sample Information File: C:\pe\Administrator\Sample Information\START.sif
Batch ID: W917144
Results Data Set: 09117A
Results Library: C:\pe\Administrator\Results\Results.mdb

==========

Method Loaded
Method Name: OPT5 Method Last Saved: 4/20/2009 3:46:10 PM
IEC File: OPTIMA5.iec MSF File:
Method Description:

==========

Sequence No.: 1 ZZZZZZ
Sample ID: ~~W917144 BLK1 KG~~ 4/29/09 Autosampler Location: 38
Analyst: Date Collected: 4/27/2009 8:41:04 AM
Initial Sample Wt: Data Type: Original
Dilution: Initial Sample Vol:
Sample Prep Vol:

---------- ZZZZZZ ----------

Mean Data: ~~W917144 BLK1 KG~~ 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	191212.5	152.842	%	0.0526				0.03%
Internal Standard Check greater than the upper limit for Lu 261.542 R. Recovery = 152.8%								
Lu 261.542 A	4385535.8	184.591	%	2.1513				1.17%
Internal Standard Check greater than the upper limit for Lu 261.542 A. Recovery = 184.6%								
Ag 328.068 At	5.1	0.000036	mg/L	0.0000991	0.000036	mg/L	0.0000991	275.72%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	-79.3	-0.065465	mg/L	0.0009876	-0.065465	mg/L	0.0009876	1.51%
QC value less than the lower limit for Al 308.215 R Recovery = Not calculated								
As 188.979 At	3.0	0.003722	mg/L	0.0005631	0.003722	mg/L	0.0005631	15.13%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	1.6	0.000866	mg/L	0.0002702	0.000866	mg/L	0.0002702	31.21%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	13.1	0.000329	mg/L	0.0000256	0.000329	mg/L	0.0000256	7.80%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	-24.4	-0.000184	mg/L	0.0000245	-0.000184	mg/L	0.0000245	13.30%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	-10.9	-0.010146	mg/L	0.0013596	-0.010146	mg/L	0.0013596	13.40%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	41.6	0.012084	mg/L	0.0002430	0.012084	mg/L	0.0002430	2.01%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	39.3	0.001215	mg/L	0.0000033	0.001215	mg/L	0.0000033	0.27%
QC value greater than the upper limit for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	-195.8	-0.003171	mg/L	0.0000547	-0.003171	mg/L	0.0000547	1.73%
Co 228.616 At	40.9	0.002515	mg/L	0.0000077	0.002515	mg/L	0.0000077	0.31%
QC value within limits for Co 228.616 A Recovery = Not calculated								
Cr 267.716 At	-71.8	-0.001910	mg/L	0.0001186	-0.001910	mg/L	0.0001186	6.21%
QC value within limits for Cr 267.716 A Recovery = Not calculated								
Cu 324.752 At	-2019.8	-0.012021	mg/L	0.0002409	-0.012021	mg/L	0.0002409	2.00%
QC value less than the lower limit for Cu 324.752 A Recovery = Not calculated								
Fe 273.955 Rt	-1.0	-0.001701	mg/L	0.0007780	-0.001701	mg/L	0.0007780	45.73%
QC value within limits for Fe 273.955 R Recovery = Not calculated								
Ga 417.206 At	60.3	0.000807	mg/L	0.0001211	0.000807	mg/L	0.0001211	15.01%
QC value within limits for Ga 417.206 A Recovery = Not calculated								
K 766.490 Rt	-85.3	-0.034402	mg/L	0.0022628	-0.034402	mg/L	0.0022628	6.58%
QC value within limits for K 766.490 R Recovery = Not calculated								
La 379.478 At	257.6	0.001208	mg/L	0.0000648	0.001208	mg/L	0.0000648	5.37%
QC value within limits for La 379.478 A Recovery = Not calculated								
Li 670.784 Rt	-200.1	-0.001856	mg/L	0.0001196	-0.001856	mg/L	0.0001196	6.44%
QC value within limits for Li 670.784 R Recovery = Not calculated								
Mg 279.077 Rt	-3.5	-0.007189	mg/L	0.0010225	-0.007189	mg/L	0.0010225	14.22%
QC value within limits for Mg 279.077 R Recovery = Not calculated								
Mn 260.568 Rt	-3.0	-0.000234	mg/L	0.0000350	-0.000234	mg/L	0.0000350	14.98%

78

QC value within limits for Mn 260.568 R Recovery = Not calculated

Mo 202.031 At	-18.8	-0.002397 mg/L	0.0000524	-0.002397 mg/L	0.0000524	2.18%

QC value within limits for Mo 202.031 A Recovery = Not calculated

Na 589.592 Rt	-546.4	-0.077121 mg/L	0.0001551	-0.077121 mg/L	0.0001551	0.20%

QC value within limits for Na 589.592 R Recovery = Not calculated

Ni 232.003 At	37.4	0.003921 mg/L	0.0001924	0.003921 mg/L	0.0001924	4.91%

QC value within limits for Ni 232.003 A Recovery = Not calculated

P 213.617 At	33.3	0.022085 mg/L	0.0001880	0.022085 mg/L	0.0001880	0.85%

QC value within limits for P 213.617 A Recovery = Not calculated

Pb 220.353 At	-15.8	-0.004476 mg/L	0.0004590	-0.004476 mg/L	0.0004590	10.25%

QC value less than the lower limit for Pb 220.353 A Recovery = Not calculated

Sb 206.836 At	2.6	0.001613 mg/L	0.0008948	0.001613 mg/L	0.0008948	55.47%

QC value within limits for Sb 206.836 A Recovery = Not calculated

Sc 361.383 At	4.4	0.000005 mg/L	0.0000027	0.000005 mg/L	0.0000027	56.01%

QC value within limits for Sc 361.383 A Recovery = Not calculated

Se 196.026 At	11.4	0.026191 mg/L	0.0035215	0.026191 mg/L	0.0035215	13.45%

QC value greater than the upper limit for Se 196.026 A Recovery = Not calculated

Si 251.611 Rt	-20.4	-0.015274 mg/L	0.0003727	-0.015274 mg/L	0.0003727	2.44%

QC value within limits for Si 251.611 R Recovery = Not calculated

SIO2 251.611 Rt	-20.4	-0.032688 mg/L	0.0007976	-0.032688 mg/L	0.0007976	2.44%

QC value within limits for SIO2 251.611 R Recovery = Not calculated

Sn 189.927 At	15.8	0.006487 mg/L	0.0003330	0.006487 mg/L	0.0003330	5.13%

QC value within limits for Sn 189.927 A Recovery = Not calculated

Sr 421.552 Rt	-89.6	-0.000126 mg/L	0.0000057	-0.000126 mg/L	0.0000057	4.49%

QC value within limits for Sr 421.552 R Recovery = Not calculated

Ti 336.121 At	141.8	0.000567 mg/L	0.0000313	0.000567 mg/L	0.0000313	5.51%

QC value within limits for Ti 336.121 A Recovery = Not calculated

Tl 190.801 At	4.0	0.005430 mg/L	0.0003718	0.005430 mg/L	0.0003718	6.85%

QC value within limits for Tl 190.801 A Recovery = Not calculated

U 385.958 At	-343.2	-0.019786 mg/L	0.0010497	-0.019786 mg/L	0.0010497	5.31%
V 292.402 At	136.8	0.001609 mg/L	0.0000252	0.001609 mg/L	0.0000252	1.56%

QC value within limits for V 292.402 A Recovery = Not calculated

Zn 206.200 At	-10.3	-0.001159 mg/L	0.0000429	-0.001159 mg/L	0.0000429	3.70%

QC value within limits for Zn 206.200 A Recovery = Not calculated

Internal Standard Check failed. Continue with analysis.

QC Failed. Continue with analysis.

Sequence No.: 2 ZZZZZ
Sample ID: ~~W917144-BS1~~ KG 4/29/09
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 39
Date Collected: 4/27/2009 8:46:56 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

ZZZZZ
Mean Data: ~~W917144-BS1~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	121389.8	97.0309	%	0.50210				0.52%
Lu 261.542 A	2307410.7	97.1208	%	0.12797				0.13%
Ag 328.068 At	6560.0	0.048853	mg/L	0.0001823	0.048853	mg/L	0.0001823	0.37%
QC value within limits for Ag 328.068 A Recovery = 97.71%								
Al 308.215 Rt	1249.6	0.997612	mg/L	0.0028148	0.997612	mg/L	0.0028148	0.28%
QC value within limits for Al 308.215 R Recovery = 99.76%								
As 188.979 At	770.2	0.927630	mg/L	0.0074411	0.927630	mg/L	0.0074411	0.80%
QC value within limits for As 188.979 A Recovery = 92.76%								
B 249.677 Rt	1810.5	0.971076	mg/L	0.0003291	0.971076	mg/L	0.0003291	0.03%
QC value within limits for B 249.677 R Recovery = 97.11%								
Ba 233.527 At	38483.8	0.971296	mg/L	0.0019295	0.971296	mg/L	0.0019295	0.20%
QC value within limits for Ba 233.527 A Recovery = 97.13%								
Be 313.107 Rt	125814.4	0.942165	mg/L	0.0058422	0.942165	mg/L	0.0058422	0.62%
QC value within limits for Be 313.107 R Recovery = 94.22%								
Bi 222.821 At	1056.0	0.909392	mg/L	0.0065735	0.909392	mg/L	0.0065735	0.72%
QC value within limits for Bi 222.821 A Recovery = 90.94%								
Ca 315.887 Rt	66974.0	19.2984	mg/L	0.01390	19.2984	mg/L	0.01390	0.07%
QC value within limits for Ca 315.887 R Recovery = 96.49%								
Cd 226.502 At	30711.2	0.950918	mg/L	0.0038952	0.950918	mg/L	0.0038952	0.41%
QC value within limits for Cd 226.502 A Recovery = 95.09%								
Ce 418.660 At	-179.4	0.000116	mg/L	0.0000442	0.000116	mg/L	0.0000442	37.98%
Co 228.616 At	15518.0	0.950268	mg/L	0.0008877	0.950268	mg/L	0.0008877	0.09%
QC value within limits for Co 228.616 A Recovery = 95.03%								
Cr 267.716 At	36049.1	0.958459	mg/L	0.0008863	0.958459	mg/L	0.0008863	0.09%
QC value within limits for Cr 267.716 A Recovery = 95.85%								
Cu 324.752 At	160104.3	0.954281	mg/L	0.0070185	0.954281	mg/L	0.0070185	0.74%
QC value within limits for Cu 324.752 A Recovery = 95.43%								
Fe 273.955 Rt	5395.1	9.52014	mg/L	0.013374	9.52014	mg/L	0.013374	0.14%
QC value within limits for Fe 273.955 R Recovery = 95.20%								
Ga 417.206 At	78687.0	0.926657	mg/L	0.0048883	0.926657	mg/L	0.0048883	0.53%
QC value within limits for Ga 417.206 A Recovery = 92.67%								
K 766.490 Rt	46871.6	18.8993	mg/L	0.03610	18.8993	mg/L	0.03610	0.19%
QC value within limits for K 766.490 R Recovery = 94.50%								
La 379.478 At	203843.1	0.952667	mg/L	0.0047809	0.952667	mg/L	0.0047809	0.50%
QC value within limits for La 379.478 A Recovery = 95.27%								
Li 670.784 Rt	100285.8	0.929818	mg/L	0.0068144	0.929818	mg/L	0.0068144	0.73%
QC value within limits for Li 670.784 R Recovery = 92.98%								
Mg 279.077 Rt	9624.5	19.5352	mg/L	0.05588	19.5352	mg/L	0.05588	0.29%
QC value within limits for Mg 279.077 R Recovery = 97.68%								
Mn 260.568 Rt	12313.9	0.951596	mg/L	0.0006473	0.951596	mg/L	0.0006473	0.07%
QC value within limits for Mn 260.568 R Recovery = 95.16%								
Mo 202.031 At	7627.8	0.967519	mg/L	0.0014310	0.967519	mg/L	0.0014310	0.15%
QC value within limits for Mo 202.031 A Recovery = 96.75%								
Na 589.592 Rt	131667.9	18.5833	mg/L	0.22110	18.5833	mg/L	0.22110	1.19%
QC value within limits for Na 589.592 R Recovery = 97.81%								
Ni 232.003 At	9056.2	0.910016	mg/L	0.0024527	0.910016	mg/L	0.0024527	0.27%
QC value within limits for Ni 232.003 A Recovery = 91.00%								
P 213.617 At	1422.3	0.919229	mg/L	0.0067346	0.919229	mg/L	0.0067346	0.73%
QC value within limits for P 213.617 A Recovery = 91.92%								
Pb 220.353 At	3319.7	0.947965	mg/L	0.0071733	0.947965	mg/L	0.0071733	0.76%
QC value within limits for Pb 220.353 A Recovery = 94.80%								
Sb 206.836 At	1499.7	0.917234	mg/L	0.0080113	0.917234	mg/L	0.0080113	0.87%
QC value within limits for Sb 206.836 A Recovery = 91.72%								
Sc 361.383 At	558547.6	0.463570	mg/L	0.0021352	0.463570	mg/L	0.0021352	0.46%
QC value within limits for Sc 361.383 A Recovery = 92.71%								
Se 196.026 At	388.8	0.896204	mg/L	0.0012692	0.896204	mg/L	0.0012692	0.14%
QC value within limits for Se 196.026 A Recovery = 89.62%								
Si 251.611 Rt	6558.5	4.84471	mg/L	0.007419	4.84471	mg/L	0.007419	0.15%
QC value within limits for Si 251.611 R Recovery = 96.89%								
SIO2 251.611 Rt	6558.5	10.3685	mg/L	0.01588	10.3685	mg/L	0.01588	0.15%

QC value within limits for SIO2 251.611 R Recovery = 96.90%

Sn 189.927 A†	2249.7	0.926395 mg/L	0.0064945	0.926395 mg/L	0.0064945	0.70%

QC value within limits for Sn 189.927 A Recovery = 92.64%

Sr 421.552 R†	661691.4	0.928458 mg/L	0.0041046	0.928458 mg/L	0.0041046	0.44%

QC value within limits for Sr 421.552 R Recovery = 92.85%

Ti 336.121 A†	264627.5	0.955633 mg/L	0.0045318	0.955633 mg/L	0.0045318	0.47%

QC value within limits for Ti 336.121 A Recovery = 95.56%

Tl 190.801 A†	687.1	0.926058 mg/L	0.0123809	0.926058 mg/L	0.0123809	1.34%

QC value within limits for Tl 190.801 A Recovery = 92.61%

U 385.958 A†	1153.7	-0.004224 mg/L	0.0006981	-0.004224 mg/L	0.0006981	16.53%

QC value less than the lower limit for U 385.958 A Recovery = -0.42%

V 292.402 A†	77957.0	0.968858 mg/L	0.0011347	0.968858 mg/L	0.0011347	0.12%

QC value within limits for V 292.402 A Recovery = 96.89%

Zn 206.200 A†	8455.3	0.955051 mg/L	0.0028158	0.955051 mg/L	0.0028158	0.29%

QC value within limits for Zn 206.200 A Recovery = 95.51%

QC Failed. Continue with analysis.

81

User canceled analysis.

==========

Analysis Begun

Start Time: 4/27/2009 8:52:03 AM
Logged In Analyst: Optima5
Spectrometer Model: Optima 5300 DV, S/N 077N5011902Autosampler Model: AS-93plus

Plasma On Time: 4/27/2009 6:27:37 AM
Technique: ICP Continuous

Sample Information File: C:\pe\Administrator\Sample Information\START.sif
Batch ID: W917144
Results Data Set: 09117A
Results Library: C:\pe\Administrator\Results\Results.mdb

==========

Sequence No.: 1 ZZZZZZ
Sample ID: ~~W917144-BLK1~~ KG 4/29/09
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 38
Date Collected: 4/27/2009 8:52:05 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

ZZZZZZ

Mean Data: ~~W917144-BLK1~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	120584.4	96.3871	%	0.55644				0.58%
Lu 261.542 A	2360766.1	99.3665	%	0.01108				0.01%
Ag 328.068 At	-20.5	-0.000152	mg/L	0.0000207	-0.000152	mg/L	0.0000207	13.62%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	5.1	0.004210	mg/L	0.0013638	0.004210	mg/L	0.0013638	32.39%
QC value within limits for Al 308.215 R Recovery = Not calculated								
As 188.979 At	-1.9	-0.002373	mg/L	0.0000821	-0.002373	mg/L	0.0000821	3.46%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	8.5	0.004585	mg/L	0.0013514	0.004585	mg/L	0.0013514	29.48%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	-3.7	-0.000092	mg/L	0.0000002	-0.000092	mg/L	0.0000002	0.24%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	11.8	0.000088	mg/L	0.0000165	0.000088	mg/L	0.0000165	18.65%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	8.0	0.007489	mg/L	0.0001746	0.007489	mg/L	0.0001746	2.33%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	7.7	0.002238	mg/L	0.0000694	0.002238	mg/L	0.0000694	3.10%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	7.0	0.000217	mg/L	0.0000935	0.000217	mg/L	0.0000935	43.05%
QC value within limits for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	-18.5	-0.000301	mg/L	0.0001260	-0.000301	mg/L	0.0001260	41.89%
Co 228.616 At	-1.9	-0.000118	mg/L	0.0001154	-0.000118	mg/L	0.0001154	98.21%
QC value within limits for Co 228.616 A Recovery = Not calculated								
Cr 267.716 At	7.8	0.000207	mg/L	0.0000674	0.000207	mg/L	0.0000674	32.51%
QC value within limits for Cr 267.716 A Recovery = Not calculated								
Cu 324.752 At	7.0	0.000042	mg/L	0.0001097	0.000042	mg/L	0.0001097	262.27%
QC value within limits for Cu 324.752 A Recovery = Not calculated								
Fe 273.955 Rt	-0.7	-0.001222	mg/L	0.0010820	-0.001222	mg/L	0.0010820	88.52%
QC value within limits for Fe 273.955 R Recovery = Not calculated								
Ga 417.206 At	10.9	0.000138	mg/L	0.0000370	0.000138	mg/L	0.0000370	26.71%
QC value within limits for Ga 417.206 A Recovery = Not calculated								
K 766.490 Rt	-47.2	-0.019032	mg/L	0.0079325	-0.019032	mg/L	0.0079325	41.68%
QC value within limits for K 766.490 R Recovery = Not calculated								
La 379.478 At	18.3	0.000087	mg/L	0.0000322	0.000087	mg/L	0.0000322	36.97%
QC value within limits for La 379.478 A Recovery = Not calculated								
Li 670.784 Rt	-179.2	-0.001661	mg/L	0.0000125	-0.001661	mg/L	0.0000125	0.75%
QC value within limits for Li 670.784 R Recovery = Not calculated								
Mg 279.077 Rt	1.5	0.002944	mg/L	0.0062471	0.002944	mg/L	0.0062471	212.17%
QC value within limits for Mg 279.077 R Recovery = Not calculated								
Mn 260.568 Rt	0.2	0.000019	mg/L	0.0000340	0.000019	mg/L	0.0000340	175.70%
QC value within limits for Mn 260.568 R Recovery = Not calculated								
Mo 202.031 At	4.5	0.000571	mg/L	0.0001297	0.000571	mg/L	0.0001297	22.72%
QC value within limits for Mo 202.031 A Recovery = Not calculated								
Na 589.592 Rt	-337.6	-0.047644	mg/L	0.0006434	-0.047644	mg/L	0.0006434	1.35%
QC value within limits for Na 589.592 R Recovery = Not calculated								
Ni 232.003 At	-11.9	-0.001232	mg/L	0.0005558	-0.001232	mg/L	0.0005558	45.11%
QC value within limits for Ni 232.003 A Recovery = Not calculated								

P 213.617 At	0.4	0.000258	mg/L	0.0004799	0.000258	mg/L	0.0004799 186.31%
QC value within limits for P 213.617 A Recovery = Not calculated							
Pb 220.353 At	-3.1	-0.000895	mg/L	0.0003028	-0.000895	mg/L	0.0003028 33.83%
QC value within limits for Pb 220.353 A Recovery = Not calculated							
Sb 206.836 At	-0.1	-0.000043	mg/L	0.0009454	-0.000043	mg/L	0.0009454 >999.9%
QC value within limits for Sb 206.836 A Recovery = Not calculated							
Sc 361.383 At	40.7	0.000034	mg/L	0.0000192	0.000034	mg/L	0.0000192 56.50%
QC value within limits for Sc 361.383 A Recovery = Not calculated							
Se 196.026 At	-3.4	-0.007926	mg/L	0.0013228	-0.007926	mg/L	0.0013228 16.69%
QC value within limits for Se 196.026 A Recovery = Not calculated							
Si 251.611 Rt	-2.5	-0.001862	mg/L	0.0003542	-0.001862	mg/L	0.0003542 19.02%
QC value within limits for Si 251.611 R Recovery = Not calculated							
SIO2 251.611 Rt	-2.5	-0.003984	mg/L	0.0007578	-0.003984	mg/L	0.0007578 19.02%
QC value within limits for SIO2 251.611 R Recovery = Not calculated							
Sn 189.927 At	-1.8	-0.000753	mg/L	0.0007676	-0.000753	mg/L	0.0007676 101.88%
QC value within limits for Sn 189.927 A Recovery = Not calculated							
Sr 421.552 Rt	48.3	0.000068	mg/L	0.0000188	0.000068	mg/L	0.0000188 27.76%
QC value within limits for Sr 421.552 R Recovery = Not calculated							
Ti 336.121 At	-25.3	-0.000108	mg/L	0.0000176	-0.000108	mg/L	0.0000176 16.39%
QC value within limits for Ti 336.121 A Recovery = Not calculated							
Tl 190.801 At	-1.3	-0.001762	mg/L	0.0011300	-0.001762	mg/L	0.0011300 64.12%
QC value within limits for Tl 190.801 A Recovery = Not calculated							
U 385.958 At	-11.8	-0.000683	mg/L	0.0010757	-0.000683	mg/L	0.0010757 157.59%
V 292.402 At	-0.7	-0.000005	mg/L	0.0000396	-0.000005	mg/L	0.0000396 788.29%
QC value within limits for V 292.402 A Recovery = Not calculated							
Zn 206.200 At	-3.9	-0.000442	mg/L	0.0000114	-0.000442	mg/L	0.0000114 2.59%
QC value within limits for Zn 206.200 A Recovery = Not calculated							

All analyte(s) passed QC.

User canceled analysis.

==========

Analysis Begun

Start Time: 4/27/2009 8:57:13 AM
Logged In Analyst: Optima5
Spectrometer Model: Optima 5300 DV, S/N 077N5011902
Plasma On Time: 4/27/2009 6:27:37 AM
Technique: ICP Continuous
Autosampler Model: AS-93plus

Sample Information File: C:\pe\Administrator\Sample Information\START.sif
Batch ID: W917144
Results Data Set: 09117A
Results Library: C:\pe\Administrator\Results\Results.mdb

==========

Sequence No.: 4 ZZZZZZ
Sample ID: ~~W9D0221-01~~ KG 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:
ZZZZZZ
Autosampler Location: 40
Date Collected: 4/27/2009 8:57:15 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ~~W9D0221-01-KG~~ 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	124298.0	99.3555	%	0.66654				0.67%
Lu 261.542 A	2385813.2	100.421	%	0.0180				0.02%
Ag 328.068 At	-24.9	-0.000180	mg/L	0.0000921	-0.000180	mg/L	0.0000921	51.24%
Al 308.215 Rt	4.1	0.003284	mg/L	0.0018688	0.003284	mg/L	0.0018688	56.91%
As 188.979 At	-0.3	-0.000383	mg/L	0.0019231	-0.000383	mg/L	0.0019231	502.54%
B 249.677 Rt	10.6	0.005697	mg/L	0.0004685	0.005697	mg/L	0.0004685	8.22%
Ba 233.527 At	981.0	0.024764	mg/L	0.0000033	0.024764	mg/L	0.0000033	0.01%
Be 313.107 Rt	-0.1	-0.000001	mg/L	0.0000039	-0.000001	mg/L	0.0000039	439.37%
Bi 222.821 At	-3.0	0.002352	mg/L	0.0013709	0.002352	mg/L	0.0013709	58.29%
Ca 315.887 Rt	57335.9	16.5245	mg/L	0.03708	16.5245	mg/L	0.03708	0.22%
Cd 226.502 At	8.1	0.000242	mg/L	0.0001954	0.000242	mg/L	0.0001954	80.78%
Ce 418.660 At	40.1	0.000665	mg/L	0.0002322	0.000665	mg/L	0.0002322	34.94%
Co 228.616 At	-0.3	-0.000021	mg/L	0.0000909	-0.000021	mg/L	0.0000909	434.28%
Cr 267.716 At	-8.3	-0.000249	mg/L	0.0000616	-0.000249	mg/L	0.0000616	24.74%
Cu 324.752 At	-255.1	-0.001523	mg/L	0.0000777	-0.001523	mg/L	0.0000777	5.10%
Fe 273.955 Rt	28.7	0.050455	mg/L	0.0057771	0.050455	mg/L	0.0057771	11.45%
Ga 417.206 At	-5.1	-0.000091	mg/L	0.0001275	-0.000091	mg/L	0.0001275	140.53%
K 766.490 Rt	1938.2	0.781504	mg/L	0.0015358	0.781504	mg/L	0.0015358	0.20%
La 379.478 At	5.5	-0.000006	mg/L	0.0000468	-0.000006	mg/L	0.0000468	728.50%
Li 670.784 Rt	242.4	0.002247	mg/L	0.0002270	0.002247	mg/L	0.0002270	10.10%
Mg 279.077 Rt	2124.1	4.31118	mg/L	0.011130	4.31118	mg/L	0.011130	0.26%
Mn 260.568 Rt	41.4	0.003061	mg/L	0.0000375	0.003061	mg/L	0.0000375	1.23%
Mo 202.031 At	36.1	0.004335	mg/L	0.0003639	0.004335	mg/L	0.0003639	8.39%
Na 589.592 Rt	24665.2	3.48119	mg/L	0.033367	3.48119	mg/L	0.033367	0.96%
Ni 232.003 At	-2.8	0.000519	mg/L	0.0002706	0.000519	mg/L	0.0002706	52.11%
P 213.617 At	2.6	0.001826	mg/L	0.0001431	0.001826	mg/L	0.0001431	7.84%
Pb 220.353 At	-2.6	-0.000024	mg/L	0.0006536	-0.000024	mg/L	0.0006536	>999.9%
Sb 206.836 At	3.5	0.002138	mg/L	0.0041591	0.002138	mg/L	0.0041591	194.54%
Sc 361.383 At	-95.5	-0.000082	mg/L	0.0000175	-0.000082	mg/L	0.0000175	21.48%
Se 196.026 At	4.3	0.009372	mg/L	0.0012750	0.009372	mg/L	0.0012750	13.60%
Si 251.611 Rt	8834.4	6.59334	mg/L	0.032077	6.59334	mg/L	0.032077	0.49%
SIO2 251.611 Rt	8834.4	14.1098	mg/L	0.06864	14.1098	mg/L	0.06864	0.49%
Sn 189.927 At	-0.4	0.000212	mg/L	0.0009147	0.000212	mg/L	0.0009147	431.65%
Sr 421.552 Rt	124874.3	0.175060	mg/L	0.0002297	0.175060	mg/L	0.0002297	0.13%
Ti 336.121 At	97.4	0.000282	mg/L	0.0000213	0.000282	mg/L	0.0000213	7.54%
Tl 190.801 At	2.0	0.002614	mg/L	0.0001050	0.002614	mg/L	0.0001050	4.02%
U 385.958 At	46.4	0.002093	mg/L	0.0003891	0.002093	mg/L	0.0003891	18.59%
V 292.402 At	24.9	0.000351	mg/L	0.0001237	0.000351	mg/L	0.0001237	35.25%
Zn 206.200 At	-6.2	-0.000744	mg/L	0.0002612	-0.000744	mg/L	0.0002612	35.09%

84

Sequence No.: 5 ZZZZZ
Sample ID: ~~W9D0221-02~~ KG 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 41
Date Collected: 4/27/2009 9:03:02 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

ZZZZZ

Mean Data: ~~W9D0221-02~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	123342.5	98.5918	%	0.37500				0.38%
Lu 261.542 A	2331199.3	98.1220	%	0.61732				0.63%
Ag 328.068 At	-28.2	-0.000223	mg/L	0.0000446	-0.000223	mg/L	0.0000446	20.01%
Al 308.215 Rt	0.3	-0.000423	mg/L	0.0000618	-0.000423	mg/L	0.0000618	14.60%
As 188.979 At	-2.3	-0.002765	mg/L	0.0041071	-0.002765	mg/L	0.0041071	148.57%
B 249.677 Rt	31.6	0.016965	mg/L	0.0005320	0.016965	mg/L	0.0005320	3.14%
Ba 233.527 At	1416.5	0.035748	mg/L	0.0001808	0.035748	mg/L	0.0001808	0.51%
Be 313.107 Rt	-5.4	-0.000040	mg/L	0.0000305	-0.000040	mg/L	0.0000305	75.52%
Bi 222.821 At	-3.5	0.003485	mg/L	0.0020744	0.003485	mg/L	0.0020744	59.52%
Ca 315.887 Rt	288328.1	83.0977	mg/L	0.24029	83.0977	mg/L	0.24029	0.29%
Cd 226.502 At	3.6	0.000034	mg/L	0.0001499	0.000034	mg/L	0.0001499	446.88%
Ce 418.660 At	84.5	0.001377	mg/L	0.0003709	0.001377	mg/L	0.0003709	26.95%
Co 228.616 At	-3.1	-0.000222	mg/L	0.0001871	-0.000222	mg/L	0.0001871	84.23%
Cr 267.716 At	-0.4	-0.000104	mg/L	0.0001239	-0.000104	mg/L	0.0001239	118.94%
Cu 324.752 At	-282.3	-0.001692	mg/L	0.0000950	-0.001692	mg/L	0.0000950	5.62%
Fe 273.955 Rt	230.0	0.405751	mg/L	0.0030221	0.405751	mg/L	0.0030221	0.74%
Ga 417.206 At	-3.5	-0.000166	mg/L	0.0000279	-0.000166	mg/L	0.0000279	16.77%
K 766.490 Rt	4869.0	1.96326	mg/L	0.013408	1.96326	mg/L	0.013408	0.68%
La 379.478 At	69.5	0.000150	mg/L	0.0001720	0.000150	mg/L	0.0001720	114.60%
Li 670.784 Rt	665.3	0.006169	mg/L	0.0001234	0.006169	mg/L	0.0001234	2.00%
Mg 279.077 Rt	6141.1	12.4638	mg/L	0.15174	12.4638	mg/L	0.15174	1.22%
Mn 260.568 Rt	3915.6	0.302702	mg/L	0.0008298	0.302702	mg/L	0.0008298	0.27%
Mo 202.031 At	58.1	0.006160	mg/L	0.0001849	0.006160	mg/L	0.0001849	3.00%
Na 589.592 Rt	112918.5	15.9371	mg/L	0.34357	15.9371	mg/L	0.34357	2.16%
Ni 232.003 At	-24.6	-0.000263	mg/L	0.0002692	-0.000263	mg/L	0.0002692	102.26%
P 213.617 At	12.6	0.008541	mg/L	0.0020825	0.008541	mg/L	0.0020825	24.38%
Pb 220.353 At	-1.0	0.001074	mg/L	0.0018622	0.001074	mg/L	0.0018622	173.36%
Sb 206.836 At	3.3	0.002019	mg/L	0.0002480	0.002019	mg/L	0.0002480	12.28%
Sc 361.383 At	-261.0	-0.000241	mg/L	0.0000055	-0.000241	mg/L	0.0000055	2.28%
Se 196.026 At	6.0	0.012278	mg/L	0.0028094	0.012278	mg/L	0.0028094	22.88%
Si 251.611 Rt	12135.3	9.05568	mg/L	0.083978	9.05568	mg/L	0.083978	0.93%
SIO2 251.611 Rt	12135.3	19.3792	mg/L	0.17971	19.3792	mg/L	0.17971	0.93%
Sn 189.927 At	-22.3	-0.007305	mg/L	0.0004851	-0.007305	mg/L	0.0004851	6.64%
Sr 421.552 Rt	699630.1	0.980921	mg/L	0.0047683	0.980921	mg/L	0.0047683	0.49%
Ti 336.121 At	194.0	0.000204	mg/L	0.0000540	0.000204	mg/L	0.0000540	26.47%
Tl 190.801 At	0.1	0.000955	mg/L	0.0006088	0.000955	mg/L	0.0006088	63.72%
U 385.958 At	221.0	0.009383	mg/L	0.0002041	0.009383	mg/L	0.0002041	2.18%
V 292.402 At	14.0	0.000268	mg/L	0.0001765	0.000268	mg/L	0.0001765	65.84%
Zn 206.200 At	-8.5	-0.001186	mg/L	0.0001128	-0.001186	mg/L	0.0001128	9.51%

85

Sequence No.: 6
Sample ID: ~~W9D0221-03~~ KG 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 42
Date Collected: 4/27/2009 9:09:08 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ~~W9D0221-03~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	123219.7	98.4936	%	0.17931				0.18%
Lu 261.542 A	2369701.5	99.7426	%	0.48413				0.49%
Ag 328.068 At	-34.7	-0.000267	mg/L	0.0000329	-0.000267	mg/L	0.0000329	12.29%
Al 308.215 Rt	6.9	0.005268	mg/L	0.0001723	0.005268	mg/L	0.0001723	3.27%
As 188.979 At	1.5	0.001907	mg/L	0.0017382	0.001907	mg/L	0.0017382	91.13%
B 249.677 Rt	17.6	0.009464	mg/L	0.0004316	0.009464	mg/L	0.0004316	4.56%
Ba 233.527 At	2993.7	0.075561	mg/L	0.0005790	0.075561	mg/L	0.0005790	0.77%
Be 313.107 Rt	0.7	0.000005	mg/L	0.0000064	0.000005	mg/L	0.0000064	122.98%
Bi 222.821 At	-4.3	0.001688	mg/L	0.0000969	0.001688	mg/L	0.0000969	5.74%
Ca 315.887 Rt	90040.4	25.9498	mg/L	0.00901	25.9498	mg/L	0.00901	0.03%
Cd 226.502 At	7.7	0.000165	mg/L	0.0000919	0.000165	mg/L	0.0000919	55.72%
Ce 418.660 At	29.5	0.000488	mg/L	0.0002780	0.000488	mg/L	0.0002780	57.00%
Co 228.616 At	1.1	0.000039	mg/L	0.0001005	0.000039	mg/L	0.0001005	260.80%
Cr 267.716 At	-6.5	-0.000220	mg/L	0.0000038	-0.000220	mg/L	0.0000038	1.72%
Cu 324.752 At	-359.7	-0.002148	mg/L	0.0000141	-0.002148	mg/L	0.0000141	0.66%
Fe 273.955 Rt	221.0	0.390196	mg/L	0.0050022	0.390196	mg/L	0.0050022	1.28%
Ga 417.206 At	9.4	0.000021	mg/L	0.0000815	0.000021	mg/L	0.0000815	389.95%
K 766.490 Rt	2509.9	1.01203	mg/L	0.000043	1.01203	mg/L	0.000043	0.00%
La 379.478 At	40.4	0.000097	mg/L	0.0000155	0.000097	mg/L	0.0000155	15.91%
Li 670.784 Rt	329.5	0.003055	mg/L	0.0000477	0.003055	mg/L	0.0000477	1.56%
Mg 279.077 Rt	2558.1	5.19218	mg/L	0.015711	5.19218	mg/L	0.015711	0.30%
Mn 260.568 Rt	3529.9	0.273078	mg/L	0.0014695	0.273078	mg/L	0.0014695	0.54%
Mo 202.031 At	39.1	0.004587	mg/L	0.0004050	0.004587	mg/L	0.0004050	8.83%
Na 589.592 Rt	48433.2	6.83577	mg/L	0.101356	6.83577	mg/L	0.101356	1.48%
Ni 232.003 At	-17.9	0.000176	mg/L	0.0000169	0.000176	mg/L	0.0000169	9.62%
P 213.617 At	103.0	0.067666	mg/L	0.0013673	0.067666	mg/L	0.0013673	2.02%
Pb 220.353 At	2.4	0.001499	mg/L	0.0007802	0.001499	mg/L	0.0007802	52.03%
Sb 206.836 At	-1.6	-0.000999	mg/L	0.0012163	-0.000999	mg/L	0.0012163	121.76%
Sc 361.383 At	-111.4	-0.000104	mg/L	0.0000099	-0.000104	mg/L	0.0000099	9.51%
Se 196.026 At	7.4	0.016258	mg/L	0.0035825	0.016258	mg/L	0.0035825	22.04%
Si 251.611 Rt	10237.5	7.64044	mg/L	0.008007	7.64044	mg/L	0.008007	0.10%
SIO2 251.611 Rt	10237.5	16.3506	mg/L	0.01714	16.3506	mg/L	0.01714	0.10%
Sn 189.927 At	-7.2	-0.002379	mg/L	0.0004820	-0.002379	mg/L	0.0004820	20.26%
Sr 421.552 Rt	125082.1	0.175236	mg/L	0.0006800	0.175236	mg/L	0.0006800	0.39%
Ti 336.121 At	108.5	0.000259	mg/L	0.0000624	0.000259	mg/L	0.0000624	24.06%
Tl 190.801 At	3.3	0.005160	mg/L	0.0009500	0.005160	mg/L	0.0009500	18.41%
U 385.958 At	79.9	0.002871	mg/L	0.0000963	0.002871	mg/L	0.0000963	3.35%
V 292.402 At	26.0	0.000373	mg/L	0.0001064	0.000373	mg/L	0.0001064	28.53%
Zn 206.200 At	-11.8	-0.001485	mg/L	0.0001774	-0.001485	mg/L	0.0001774	11.95%

86

Sequence No.: 7 ZZZZZZ
Sample ID: ~~W9D0221-04-KG~~ 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 43
Date Collected: 4/27/2009 9:14:54 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

ZZZZZZ

Mean Data: ~~W9D0221-04-KG~~ 4/29/09

Analyte	Mean Corrected Intensity	Calib. Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	123232.2	98.5036	%	1.04876				1.06%
Lu 261.542 A	2358537.1	99.2727	%	0.22656				0.23%
Ag 328.068 At	-34.6	-0.000276	mg/L	0.0000076	-0.000276	mg/L	0.0000076	2.75%
Al 308.215 Rt	6.0	0.004612	mg/L	0.0008509	0.004612	mg/L	0.0008509	18.45%
As 188.979 At	0.6	0.000775	mg/L	0.0024676	0.000775	mg/L	0.0024676	318.44%
B 249.677 Rt	9.2	0.004947	mg/L	0.0001497	0.004947	mg/L	0.0001497	3.03%
Ba 233.527 At	1365.6	0.034473	mg/L	0.0000643	0.034473	mg/L	0.0000643	0.19%
Be 313.107 Rt	0.7	0.000005	mg/L	0.0000088	0.000005	mg/L	0.0000088	180.84%
Bi 222.821 At	-2.2	0.003278	mg/L	0.0018903	0.003278	mg/L	0.0018903	57.67%
Ca 315.887 Rt	65349.7	18.8336	mg/L	0.08134	18.8336	mg/L	0.08134	0.43%
Cd 226.502 At	7.1	0.000216	mg/L	0.0000731	0.000216	mg/L	0.0000731	33.87%
Ce 418.660 At	55.5	0.000914	mg/L	0.0001594	0.000914	mg/L	0.0001594	17.44%
Co 228.616 At	1.4	0.000068	mg/L	0.0001377	0.000068	mg/L	0.0001377	203.68%
Cr 267.716 At	-11.8	-0.000352	mg/L	0.0000112	-0.000352	mg/L	0.0000112	3.18%
Cu 324.752 At	-343.1	-0.002047	mg/L	0.0001547	-0.002047	mg/L	0.0001547	7.56%
Fe 273.955 Rt	14.0	0.024494	mg/L	0.0079976	0.024494	mg/L	0.0079976	32.65%
Ga 417.206 At	-10.0	-0.000149	mg/L	0.0001157	-0.000149	mg/L	0.0001157	77.42%
K 766.490 Rt	1842.0	0.742708	mg/L	0.0133556	0.742708	mg/L	0.0133556	1.80%
La 379.478 At	-4.1	-0.000052	mg/L	0.0000223	-0.000052	mg/L	0.0000223	42.96%
Li 670.784 Rt	156.9	0.001454	mg/L	0.0001329	0.001454	mg/L	0.0001329	9.14%
Mg 279.077 Rt	2332.3	4.73388	mg/L	0.021535	4.73388	mg/L	0.021535	0.45%
Mn 260.568 Rt	2522.9	0.195161	mg/L	0.0015459	0.195161	mg/L	0.0015459	0.79%
Mo 202.031 At	29.3	0.003442	mg/L	0.0000391	0.003442	mg/L	0.0000391	1.14%
Na 589.592 Rt	48311.9	6.81864	mg/L	0.098593	6.81864	mg/L	0.098593	1.45%
Ni 232.003 At	-9.6	0.000390	mg/L	0.0003733	0.000390	mg/L	0.0003733	95.69%
P 213.617 At	19.1	0.012603	mg/L	0.0017487	0.012603	mg/L	0.0017487	13.88%
Pb 220.353 At	1.8	0.001224	mg/L	0.0017073	0.001224	mg/L	0.0017073	139.53%
Sb 206.836 At	0.2	0.000124	mg/L	0.0007495	0.000124	mg/L	0.0007495	602.30%
Sc 361.383 At	-108.1	-0.000099	mg/L	0.0000046	-0.000099	mg/L	0.0000046	4.60%
Se 196.026 At	3.9	0.008327	mg/L	0.0029255	0.008327	mg/L	0.0029255	35.13%
Si 251.611 Rt	9154.1	6.83188	mg/L	0.026664	6.83188	mg/L	0.026664	0.39%
SIO2 251.611 Rt	9154.1	14.6202	mg/L	0.05706	14.6202	mg/L	0.05706	0.39%
Sn 189.927 At	-4.9	-0.001599	mg/L	0.0011383	-0.001599	mg/L	0.0011383	71.20%
Sr 421.552 Rt	113757.7	0.159429	mg/L	0.0002107	0.159429	mg/L	0.0002107	0.13%
Ti 336.121 At	100.8	0.000281	mg/L	0.0000069	0.000281	mg/L	0.0000069	2.45%
Tl 190.801 At	1.4	0.002363	mg/L	0.0005397	0.002363	mg/L	0.0005397	22.85%
U 385.958 At	50.0	0.002303	mg/L	0.0002582	0.002303	mg/L	0.0002582	11.21%
V 292.402 At	15.7	0.000249	mg/L	0.0000803	0.000249	mg/L	0.0000803	32.22%
Zn 206.200 At	3.0	0.000225	mg/L	0.0001716	0.000225	mg/L	0.0001716	76.32%

87

Sequence No.: 8 ZZZZZ
Sample ID: ~~W917144-DUP1~~ KG 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 44
Date Collected: 4/27/2009 9:20:39 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

ZZZZZ

Mean Data: ~~W917144-DUP1~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Calib. Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	122887.7	98.2282	%	0.55385				0.56%
Lu 261.542 A	2349998.8	98.9133	%	0.01405				0.01%
Ag 328.068 At	-10.7	-0.000102	mg/L	0.0001279	-0.000102	mg/L	0.0001279	125.24%
Al 308.215 Rt	0.9	0.000352	mg/L	0.0010677	0.000352	mg/L	0.0010677	303.01%
As 188.979 At	-2.0	-0.002516	mg/L	0.0041450	-0.002516	mg/L	0.0041450	164.75%
B 249.677 Rt	9.5	0.005118	mg/L	0.0009651	0.005118	mg/L	0.0009651	18.86%
Ba 233.527 At	1371.7	0.034628	mg/L	0.0001293	0.034628	mg/L	0.0001293	0.37%
Be 313.107 Rt	2.1	0.000015	mg/L	0.0000073	0.000015	mg/L	0.0000073	47.57%
Bi 222.821 At	-5.3	0.000408	mg/L	0.0005977	0.000408	mg/L	0.0005977	146.61%
Ca 315.887 Rt	65481.6	18.8716	mg/L	0.09945	18.8716	mg/L	0.09945	0.53%
Cd 226.502 At	4.1	0.000122	mg/L	0.0000573	0.000122	mg/L	0.0000573	46.77%
Ce 418.660 At	22.7	0.000375	mg/L	0.0000937	0.000375	mg/L	0.0000937	24.97%
Co 228.616 At	2.8	0.000160	mg/L	0.0002723	0.000160	mg/L	0.0002723	170.43%
Cr 267.716 At	-3.0	-0.000118	mg/L	0.0001321	-0.000118	mg/L	0.0001321	111.56%
Cu 324.752 At	-346.7	-0.002068	mg/L	0.0000420	-0.002068	mg/L	0.0000420	2.03%
Fe 273.955 Rt	12.0	0.020970	mg/L	0.0024197	0.020970	mg/L	0.0024197	11.54%
Ga 417.206 At	-1.6	-0.000036	mg/L	0.0001452	-0.000036	mg/L	0.0001452	405.22%
K 766.490 Rt	1854.0	0.747581	mg/L	0.0062729	0.747581	mg/L	0.0062729	0.84%
La 379.478 At	-11.9	-0.000086	mg/L	0.0001144	-0.000086	mg/L	0.0001144	133.49%
Li 670.784 Rt	141.7	0.001314	mg/L	0.0000345	0.001314	mg/L	0.0000345	2.63%
Mg 279.077 Rt	2339.0	4.74758	mg/L	0.018057	4.74758	mg/L	0.018057	0.38%
Mn 260.568 Rt	2526.4	0.195427	mg/L	0.0014590	0.195427	mg/L	0.0014590	0.75%
Mo 202.031 At	31.3	0.003698	mg/L	0.0000740	0.003698	mg/L	0.0000740	2.00%
Na 589.592 Rt	48950.9	6.90882	mg/L	0.073144	6.90882	mg/L	0.073144	1.06%
Ni 232.003 At	-8.5	0.000497	mg/L	0.0002218	0.000497	mg/L	0.0002218	44.68%
P 213.617 At	24.3	0.016011	mg/L	0.0015404	0.016011	mg/L	0.0015404	9.62%
Pb 220.353 At	-0.9	0.000463	mg/L	0.0010524	0.000463	mg/L	0.0010524	227.46%
Sb 206.836 At	-0.2	-0.000120	mg/L	0.0034299	-0.000120	mg/L	0.0034299	>999.9%
Sc 361.383 At	-97.1	-0.000090	mg/L	0.0000078	-0.000090	mg/L	0.0000078	8.69%
Se 196.026 At	3.1	0.006550	mg/L	0.0013873	0.006550	mg/L	0.0013873	21.18%
Si 251.611 Rt	9179.7	6.85100	mg/L	0.044033	6.85100	mg/L	0.044033	0.64%
SIO2 251.611 Rt	9179.7	14.6612	mg/L	0.09423	14.6612	mg/L	0.09423	0.64%
Sn 189.927 At	-5.3	-0.001739	mg/L	0.0005137	-0.001739	mg/L	0.0005137	29.54%
Sr 421.552 Rt	114694.4	0.160744	mg/L	0.0007549	0.160744	mg/L	0.0007549	0.47%
Ti 336.121 At	69.7	0.000155	mg/L	0.0000340	0.000155	mg/L	0.0000340	21.96%
Tl 190.801 At	0.3	0.000909	mg/L	0.0009005	0.000909	mg/L	0.0009005	99.07%
U 385.958 At	55.3	0.002618	mg/L	0.0009988	0.002618	mg/L	0.0009988	38.15%
V 292.402 At	7.5	0.000152	mg/L	0.0001062	0.000152	mg/L	0.0001062	69.69%
Zn 206.200 At	4.4	0.000389	mg/L	0.0000349	0.000389	mg/L	0.0000349	8.96%

98

Sequence No.: 9
Sample ID: ~~W917144-MS1~~ KG 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 45
Date Collected: 4/27/2009 9:26:23 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ~~W917144-MS1~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	124241.0	99.3099	%	0.14329				0.14%
Lu 261.542 A	2338553.0	98.4316	%	0.02500				0.03%
Ag 328.068 At	6564.9	0.048870	mg/L	0.0001464	0.048870	mg/L	0.0001464	0.30%
Al 308.215 Rt	1252.4	0.999231	mg/L	0.0004028	0.999231	mg/L	0.0004028	0.04%
As 188.979 At	826.6	0.997675	mg/L	0.0023033	0.997675	mg/L	0.0023033	0.23%
B 249.677 Rt	1833.4	0.983359	mg/L	0.0011113	0.983359	mg/L	0.0011113	0.11%
Ba 233.527 At	40273.0	1.01646	mg/L	0.003789	1.01646	mg/L	0.003789	0.37%
Be 313.107 Rt	123767.6	0.926836	mg/L	0.0035415	0.926836	mg/L	0.0035415	0.38%
Bi 222.821 At	1064.2	0.920807	mg/L	0.0063237	0.920807	mg/L	0.0063237	0.69%
Ca 315.887 Rt	129577.6	37.3406	mg/L	0.06089	37.3406	mg/L	0.06089	0.16%
Cd 226.502 At	31767.5	0.983677	mg/L	0.0047792	0.983677	mg/L	0.0047792	0.49%
Ce 418.660 At	-174.8	0.000214	mg/L	0.0006280	0.000214	mg/L	0.0006280	293.02%
Co 228.616 At	15851.4	0.970687	mg/L	0.0019603	0.970687	mg/L	0.0019603	0.20%
Cr 267.716 At	36547.9	0.971684	mg/L	0.0029873	0.971684	mg/L	0.0029873	0.31%
Cu 324.752 At	158140.7	0.942586	mg/L	0.0020932	0.942586	mg/L	0.0020932	0.22%
Fe 273.955 Rt	5442.2	9.60307	mg/L	0.020697	9.60307	mg/L	0.020697	0.22%
Ga 417.206 At	81364.5	0.958349	mg/L	0.0003125	0.958349	mg/L	0.0003125	0.03%
K 766.490 Rt	49579.3	19.9911	mg/L	0.08984	19.9911	mg/L	0.08984	0.45%
La 379.478 At	204581.1	0.956072	mg/L	0.0011540	0.956072	mg/L	0.0011540	0.12%
Li 670.784 Rt	100501.0	0.931814	mg/L	0.0030163	0.931814	mg/L	0.0030163	0.32%
Mg 279.077 Rt	11911.0	24.1761	mg/L	0.03554	24.1761	mg/L	0.03554	0.15%
Mn 260.568 Rt	14755.9	1.14048	mg/L	0.000187	1.14048	mg/L	0.000187	0.02%
Mo 202.031 At	7704.3	0.976963	mg/L	0.0044961	0.976963	mg/L	0.0044961	0.46%
Na 589.592 Rt	178727.5	25.2252	mg/L	0.09530	25.2252	mg/L	0.09530	0.38%
Ni 232.003 At	9414.7	0.947786	mg/L	0.0022151	0.947786	mg/L	0.0022151	0.23%
P 213.617 At	1567.9	1.01528	mg/L	0.000548	1.01528	mg/L	0.000548	0.05%
Pb 220.353 At	3442.5	0.983716	mg/L	0.0017495	0.983716	mg/L	0.0017495	0.18%
Sb 206.836 At	1579.2	0.965881	mg/L	0.0014163	0.965881	mg/L	0.0014163	0.15%
Sc 361.383 At	566540.1	0.470194	mg/L	0.0009351	0.470194	mg/L	0.0009351	0.20%
Se 196.026 At	453.0	1.04338	mg/L	0.001919	1.04338	mg/L	0.001919	0.18%
Si 251.611 Rt	15164.7	11.2669	mg/L	0.00422	11.2669	mg/L	0.00422	0.04%
SIO2 251.611 Rt	15164.7	24.1119	mg/L	0.00904	24.1119	mg/L	0.00904	0.04%
Sn 189.927 At	2353.9	0.969672	mg/L	0.0012145	0.969672	mg/L	0.0012145	0.13%
Sr 421.552 Rt	766903.5	1.07590	mg/L	0.002755	1.07590	mg/L	0.002755	0.26%
Ti 336.121 At	268041.9	0.967690	mg/L	0.0021654	0.967690	mg/L	0.0021654	0.22%
Tl 190.801 At	722.7	0.974486	mg/L	0.0035314	0.974486	mg/L	0.0035314	0.36%
U 385.958 At	1246.7	-0.000221	mg/L	0.0011385	-0.000221	mg/L	0.0011385	515.79%
V 292.402 At	78837.2	0.979823	mg/L	0.0028116	0.979823	mg/L	0.0028116	0.29%
Zn 206.200 At	8861.3	1.00089	mg/L	0.007212	1.00089	mg/L	0.007212	0.72%

Matrix Recovery Check: ~~W917144-MS1~~ KG 4/29/09

Analyte	Expected Conc.	Measured Conc.	Std. Dev.	Units	Recovery (%)
Al 308.215 R	1.00461	0.999231	0.000	mg/L	99.5
B 249.677 R	1.00495	0.983359	0.001	mg/L	97.8
Be 313.107 R	1.00000	0.926836	0.004	mg/L	92.7
Ca 315.887 R	38.8336	37.3406	0.061	mg/L	92.5
Fe 273.955 R	10.0245	9.60307	0.021	mg/L	95.8
K 766.490 R	20.7427	19.9911	0.090	mg/L	96.2
Li 670.784 R	1.00145	0.931814	0.003	mg/L	93.0
Mg 279.077 R	24.7339	24.1761	0.036	mg/L	97.2
Mn 260.568 R	1.19516	1.14048	0.000	mg/L	94.5
Na 589.592 R	25.8186	25.2252	0.095	mg/L	96.9
Si 251.611 R	11.8319	11.2669	0.004	mg/L	88.7
SIO2 251.611 R	25.3202	24.1119	0.009	mg/L	88.7
Sr 421.552 R	1.15943	1.07590	0.003	mg/L	91.6
Ag 328.068 A	0.049724	0.048870	0.000	mg/L	98.3
As 188.979 A	1.00077	0.997675	0.002	mg/L	99.7
Ba 233.527 A	1.03447	1.01646	0.004	mg/L	98.2

Bi 222.821 A	1.00328	0.920807	0.006	mg/L	91.8
Cd 226.502 A	1.00022	0.983677	0.005	mg/L	98.3
Co 228.616 A	1.00007	0.970687	0.002	mg/L	97.1
Cr 267.716 A	0.999648	0.971684	0.003	mg/L	97.2
Cu 324.752 A	0.997953	0.942586	0.002	mg/L	94.5
Ga 417.206 A	0.999851	0.958349	0.000	mg/L	95.8
La 379.478 A	0.999948	0.956072	0.001	mg/L	95.6
Mo 202.031 A	1.00344	0.976963	0.004	mg/L	97.4
Ni 232.003 A	1.00039	0.947786	0.002	mg/L	94.7
P 213.617 A	1.01260	1.01528	0.001	mg/L	100.3
Pb 220.353 A	1.00122	0.983716	0.002	mg/L	98.2
Sb 206.836 A	1.00012	0.965881	0.001	mg/L	96.6
Sc 361.383 A	0.499901	0.470194	0.001	mg/L	94.1
Se 196.026 A	1.00833	1.04338	0.002	mg/L	103.5
Sn 189.927 A	0.998401	0.969672	0.001	mg/L	97.1
Ti 336.121 A	1.00028	0.967690	0.002	mg/L	96.7
Tl 190.801 A	1.00236	0.974486	0.004	mg/L	97.2
U 385.958 A	1.00230	-0.000221	0.001	mg/L	-0.3
V 292.402 A	1.00025	0.979823	0.003	mg/L	98.0
Zn 206.200 A	1.00022	1.00089	0.007	mg/L	100.1

90

Sequence No.: 10
Sample ID: ~~W9D0221-05~~ KG 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 46
Date Collected: 4/27/2009 9:32:25 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ~~W9D0221-05~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	122120.8	97.6152	%	0.29289				0.30%
Lu 261.542 A	2319214.9	97.6176	%	0.11436				0.12%
Ag 328.068 At	-28.5	-0.000260	mg/L	0.0000223	-0.000260	mg/L	0.0000223	8.57%
Al 308.215 Rt	12.3	0.008714	mg/L	0.0047428	0.008714	mg/L	0.0047428	54.43%
As 188.979 At	-1.5	-0.001753	mg/L	0.0024252	-0.001753	mg/L	0.0024252	138.35%
B 249.677 Rt	27.9	0.015019	mg/L	0.0013042	0.015019	mg/L	0.0013042	8.68%
Ba 233.527 At	5750.5	0.145123	mg/L	0.0002638	0.145123	mg/L	0.0002638	0.18%
Be 313.107 Rt	3.7	0.000028	mg/L	0.0000111	0.000028	mg/L	0.0000111	39.49%
Bi 222.821 At	-1.4	0.008128	mg/L	0.0020701	0.008128	mg/L	0.0020701	25.47%
Ca 315.887 Rt	278517.1	80.2690	mg/L	0.05580	80.2690	mg/L	0.05580	0.07%
Cd 226.502 At	9.6	0.000027	mg/L	0.0000813	0.000027	mg/L	0.0000813	298.76%
Ce 418.660 At	118.2	0.001938	mg/L	0.0001188	0.001938	mg/L	0.0001188	6.13%
Co 228.616 At	-8.0	-0.000596	mg/L	0.0001566	-0.000596	mg/L	0.0001566	26.25%
Cr 267.716 At	-0.5	-0.000134	mg/L	0.0003023	-0.000134	mg/L	0.0003023	225.09%
Cu 324.752 At	-296.6	-0.001780	mg/L	0.0000623	-0.001780	mg/L	0.0000623	3.50%
Fe 273.955 Rt	791.4	1.39731	mg/L	0.001982	1.39731	mg/L	0.001982	0.14%
Ga 417.206 At	24.7	-0.000027	mg/L	0.0000699	-0.000027	mg/L	0.0000699	262.04%
K 766.490 Rt	4131.6	1.66593	mg/L	0.005195	1.66593	mg/L	0.005195	0.31%
La 379.478 At	125.2	0.000272	mg/L	0.0000022	0.000272	mg/L	0.0000022	0.82%
Li 670.784 Rt	550.3	0.005102	mg/L	0.0001570	0.005102	mg/L	0.0001570	3.08%
Mg 279.077 Rt	5426.3	11.0136	mg/L	0.05063	11.0136	mg/L	0.05063	0.46%
Mn 260.568 Rt	13907.8	1.07625	mg/L	0.002878	1.07625	mg/L	0.002878	0.27%
Mo 202.031 At	68.9	0.007577	mg/L	0.0000616	0.007577	mg/L	0.0000616	0.81%
Na 589.592 Rt	160487.8	22.6509	mg/L	0.06359	22.6509	mg/L	0.06359	0.28%
Ni 232.003 At	-55.5	0.000194	mg/L	0.0000565	0.000194	mg/L	0.0000565	29.10%
P 213.617 At	238.7	0.156934	mg/L	0.0041498	0.156934	mg/L	0.0041498	2.64%
Pb 220.353 At	-0.0	0.001525	mg/L	0.0018078	0.001525	mg/L	0.0018078	118.53%
Sb 206.836 At	7.9	0.004781	mg/L	0.0025841	0.004781	mg/L	0.0025841	54.05%
Sc 361.383 At	-226.4	-0.000236	mg/L	0.0000021	-0.000236	mg/L	0.0000021	0.89%
Se 196.026 At	6.4	0.012759	mg/L	0.0045232	0.012759	mg/L	0.0045232	35.45%
Si 251.611 Rt	17848.6	13.3205	mg/L	0.03494	13.3205	mg/L	0.03494	0.26%
SIO2 251.611 Rt	17848.6	28.5059	mg/L	0.07478	28.5059	mg/L	0.07478	0.26%
Sn 189.927 At	-17.1	-0.005243	mg/L	0.0003294	-0.005243	mg/L	0.0003294	6.28%
Sr 421.552 Rt	492876.5	0.690774	mg/L	0.0016456	0.690774	mg/L	0.0016456	0.24%
Ti 336.121 At	212.5	0.000293	mg/L	0.0000212	0.000293	mg/L	0.0000212	7.23%
Tl 190.801 At	0.9	0.004263	mg/L	0.0014164	0.004263	mg/L	0.0014164	33.23%
U 385.958 At	186.0	0.004839	mg/L	0.0003481	0.004839	mg/L	0.0003481	7.19%
V 292.402 At	-13.1	-0.000060	mg/L	0.0001467	-0.000060	mg/L	0.0001467	244.95%
Zn 206.200 At	-18.5	-0.002553	mg/L	0.0001546	-0.002553	mg/L	0.0001546	6.06%

91

Sequence No.: 11
Sample ID: CCV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 6
Date Collected: 4/27/2009 9:38:32 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCV

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	122145.2	97.6347	%	0.04758				0.05%
Lu 261.542 A	2327227.0	97.9548	%	0.09609				0.10%
Ag 328.068 At	272248.8	2.00463	mg/L	0.007907	2.00463	mg/L	0.007907	0.39%
QC value within limits for Ag 328.068 A Recovery = 100.23%								
Al 308.215 Rt	2585.9	2.04765	mg/L	0.000302	2.04765	mg/L	0.000302	0.01%
QC value within limits for Al 308.215 R Recovery = 102.38%								
As 188.979 At	1729.1	2.02353	mg/L	0.005107	2.02353	mg/L	0.005107	0.25%
QC value within limits for As 188.979 A Recovery = 101.18%								
B 249.677 Rt	3762.9	2.01815	mg/L	0.005402	2.01815	mg/L	0.005402	0.27%
QC value within limits for B 249.677 R Recovery = 100.91%								
Ba 233.527 At	80380.7	2.02922	mg/L	0.002408	2.02922	mg/L	0.002408	0.12%
QC value within limits for Ba 233.527 A Recovery = 101.46%								
Be 313.107 Rt	262676.7	1.96712	mg/L	0.007684	1.96712	mg/L	0.007684	0.39%
QC value within limits for Be 313.107 R Recovery = 98.36%								
Bi 222.821 At	4174.7	3.75469	mg/L	0.006941	3.75469	mg/L	0.006941	0.18%
QC value within limits for Bi 222.821 A Recovery = 93.87%								
Ca 315.887 Rt	7107.4	2.03726	mg/L	0.007578	2.03726	mg/L	0.007578	0.37%
QC value within limits for Ca 315.887 R Recovery = 101.86%								
Cd 226.502 At	65098.7	2.01964	mg/L	0.007050	2.01964	mg/L	0.007050	0.35%
QC value within limits for Cd 226.502 A Recovery = 100.98%								
Ce 418.660 At	-444.6	-0.003098	mg/L	0.0000652	-0.003098	mg/L	0.0000652	2.10%
QC value within limits for Ce 418.660 A Recovery = Not calculated								
Co 228.616 At	32747.2	2.00551	mg/L	0.005015	2.00551	mg/L	0.005015	0.25%
QC value within limits for Co 228.616 A Recovery = 100.28%								
Cr 267.716 At	75780.9	2.01491	mg/L	0.007537	2.01491	mg/L	0.007537	0.37%
QC value within limits for Cr 267.716 A Recovery = 100.75%								
Cu 324.752 At	331740.4	1.97680	mg/L	0.005492	1.97680	mg/L	0.005492	0.28%
QC value within limits for Cu 324.752 A Recovery = 98.84%								
Fe 273.955 Rt	1160.2	2.03262	mg/L	0.000511	2.03262	mg/L	0.000511	0.03%
QC value within limits for Fe 273.955 R Recovery = 101.63%								
Ga 417.206 At	317042.2	3.75068	mg/L	0.013638	3.75068	mg/L	0.013638	0.36%
QC value within limits for Ga 417.206 A Recovery = 93.77%								
K 766.490 Rt	48965.1	19.7434	mg/L	0.07801	19.7434	mg/L	0.07801	0.40%
QC value within limits for K 766.490 R Recovery = 98.72%								
La 379.478 At	848847.4	3.97684	mg/L	0.003904	3.97684	mg/L	0.003904	0.10%
QC value within limits for La 379.478 A Recovery = 99.42%								
Li 670.784 Rt	414269.0	3.84097	mg/L	0.007513	3.84097	mg/L	0.007513	0.20%
QC value within limits for Li 670.784 R Recovery = 96.02%								
Mg 279.077 Rt	1002.8	2.04828	mg/L	0.003466	2.04828	mg/L	0.003466	0.17%
QC value within limits for Mg 279.077 R Recovery = 102.41%								
Mn 260.568 Rt	25534.4	1.97555	mg/L	0.002057	1.97555	mg/L	0.002057	0.10%
QC value within limits for Mn 260.568 R Recovery = 98.78%								
Mo 202.031 At	15857.6	2.01244	mg/L	0.007917	2.01244	mg/L	0.007917	0.39%
QC value within limits for Mo 202.031 A Recovery = 100.62%								
Na 589.592 Rt	141378.6	19.9539	mg/L	0.08766	19.9539	mg/L	0.08766	0.44%
QC value within limits for Na 589.592 R Recovery = 99.77%								
Ni 232.003 At	19808.3	1.97604	mg/L	0.007384	1.97604	mg/L	0.007384	0.37%
QC value within limits for Ni 232.003 A Recovery = 98.80%								
P 213.617 At	14018.1	9.14946	mg/L	0.030078	9.14946	mg/L	0.030078	0.33%
QC value within limits for P 213.617 A Recovery = 91.49%								
Pb 220.353 At	7076.0	2.01951	mg/L	0.004275	2.01951	mg/L	0.004275	0.21%
QC value within limits for Pb 220.353 A Recovery = 100.98%								
Sb 206.836 At	3260.5	2.00312	mg/L	0.004399	2.00312	mg/L	0.004399	0.22%
QC value within limits for Sb 206.836 A Recovery = 100.16%								
Sc 361.383 At	1197840.1	0.994138	mg/L	0.0023348	0.994138	mg/L	0.0023348	0.23%
QC value within limits for Sc 361.383 A Recovery = 99.41%								
Se 196.026 At	847.4	1.96295	mg/L	0.010960	1.96295	mg/L	0.010960	0.56%
QC value within limits for Se 196.026 A Recovery = 98.15%								
Si 251.611 Rt	13689.1	10.1017	mg/L	0.00067	10.1017	mg/L	0.00067	0.01%
QC value within limits for Si 251.611 R Recovery = 101.02%								

92

SIO2 251.611 R†	13689.1	21.6191	mg/L	0.00145	21.6191	mg/L	0.00145	0.01%
QC value within limits for SIO2 251.611 R Recovery = 101.02%								
Sn 189.927 A†	9642.9	3.96859	mg/L	0.013529	3.96859	mg/L	0.013529	0.34%
QC value within limits for Sn 189.927 A Recovery = 99.21%								
Sr 421.552 R†	1378846.3	1.93521	mg/L	0.000942	1.93521	mg/L	0.000942	0.05%
QC value within limits for Sr 421.552 R Recovery = 96.76%								
Ti 336.121 A†	555496.9	2.00166	mg/L	0.001719	2.00166	mg/L	0.001719	0.09%
QC value within limits for Ti 336.121 A Recovery = 100.08%								
Tl 190.801 A†	1495.1	2.01430	mg/L	0.013926	2.01430	mg/L	0.013926	0.69%
QC value within limits for Tl 190.801 A Recovery = 100.72%								
U 385.958 A†	19136.5	1.00101	mg/L	0.005171	1.00101	mg/L	0.005171	0.52%
V 292.402 A†	163492.5	2.03437	mg/L	0.006543	2.03437	mg/L	0.006543	0.32%
QC value within limits for V 292.402 A Recovery = 101.72%								
Zn 206.200 A†	17991.8	2.03310	mg/L	0.002865	2.03310	mg/L	0.002865	0.14%
QC value within limits for Zn 206.200 A Recovery = 101.65%								

All analyte(s) passed QC.

93

Sequence No.: 12
Sample ID: CCB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 1
Date Collected: 4/27/2009 9:44:33 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCB

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	120893.5	96.6341	%	0.34668				0.36%
Lu 261.542 A	2353934.0	99.0790	%	0.13251				0.13%
Ag 328.068 At	1.0	0.000007	mg/L	0.0001258	0.000007	mg/L	0.0001258	>999.9%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	4.4	0.003584	mg/L	0.0074484	0.003584	mg/L	0.0074484	207.85%
QC value within limits for Al 308.215 R Recovery = Not calculated								
As 188.979 At	-1.2	-0.001528	mg/L	0.0031080	-0.001528	mg/L	0.0031080	203.42%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	14.4	0.007731	mg/L	0.0006655	0.007731	mg/L	0.0006655	8.61%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	1.8	0.000046	mg/L	0.0000141	0.000046	mg/L	0.0000141	30.92%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	17.6	0.000132	mg/L	0.0000420	0.000132	mg/L	0.0000420	31.87%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	14.1	0.013182	mg/L	0.0003136	0.013182	mg/L	0.0003136	2.38%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	2.0	0.000574	mg/L	0.0002901	0.000574	mg/L	0.0002901	50.54%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	8.4	0.000259	mg/L	0.0002177	0.000259	mg/L	0.0002177	83.94%
QC value within limits for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	14.5	0.000239	mg/L	0.0004857	0.000239	mg/L	0.0004857	203.61%
Co 228.616 At	5.2	0.000318	mg/L	0.0001635	0.000318	mg/L	0.0001635	51.38%
QC value within limits for Co 228.616 A Recovery = Not calculated								
Cr 267.716 At	5.4	0.000145	mg/L	0.0000019	0.000145	mg/L	0.0000019	1.28%
QC value within limits for Cr 267.716 A Recovery = Not calculated								
Cu 324.752 At	-175.6	-0.001047	mg/L	0.0001188	-0.001047	mg/L	0.0001188	11.35%
QC value within limits for Cu 324.752 A Recovery = Not calculated								
Fe 273.955 Rt	-0.8	-0.001373	mg/L	0.0017118	-0.001373	mg/L	0.0017118	124.72%
QC value within limits for Fe 273.955 R Recovery = Not calculated								
Ga 417.206 At	21.0	0.000242	mg/L	0.0001605	0.000242	mg/L	0.0001605	66.27%
QC value within limits for Ga 417.206 A Recovery = Not calculated								
K 766.490 Rt	-41.4	-0.016677	mg/L	0.0015678	-0.016677	mg/L	0.0015678	9.40%
QC value within limits for K 766.490 R Recovery = Not calculated								
La 379.478 At	39.5	0.000185	mg/L	0.0000560	0.000185	mg/L	0.0000560	30.28%
QC value within limits for La 379.478 A Recovery = Not calculated								
Li 670.784 Rt	-122.0	-0.001131	mg/L	0.0000525	-0.001131	mg/L	0.0000525	4.64%
QC value within limits for Li 670.784 R Recovery = Not calculated								
Mg 279.077 Rt	3.1	0.006273	mg/L	0.0011782	0.006273	mg/L	0.0011782	18.78%
QC value within limits for Mg 279.077 R Recovery = Not calculated								
Mn 260.568 Rt	-1.5	-0.000117	mg/L	0.0002172	-0.000117	mg/L	0.0002172	186.07%
QC value within limits for Mn 260.568 R Recovery = Not calculated								
Mo 202.031 At	6.8	0.000861	mg/L	0.0000576	0.000861	mg/L	0.0000576	6.69%
QC value within limits for Mo 202.031 A Recovery = Not calculated								
Na 589.592 Rt	-411.6	-0.058093	mg/L	0.0015061	-0.058093	mg/L	0.0015061	2.59%
QC value within limits for Na 589.592 R Recovery = Not calculated								
Ni 232.003 At	-3.1	-0.000320	mg/L	0.0000815	-0.000320	mg/L	0.0000815	25.44%
QC value within limits for Ni 232.003 A Recovery = Not calculated								
P 213.617 At	2.8	0.001898	mg/L	0.0004220	0.001898	mg/L	0.0004220	22.23%
QC value within limits for P 213.617 A Recovery = Not calculated								
Pb 220.353 At	-4.0	-0.001136	mg/L	0.0007253	-0.001136	mg/L	0.0007253	63.82%
QC value within limits for Pb 220.353 A Recovery = Not calculated								
Sb 206.836 At	1.6	0.001001	mg/L	0.0004173	0.001001	mg/L	0.0004173	41.70%
QC value within limits for Sb 206.836 A Recovery = Not calculated								
Sc 361.383 At	58.7	0.000049	mg/L	0.0000136	0.000049	mg/L	0.0000136	27.95%
QC value within limits for Sc 361.383 A Recovery = Not calculated								
Se 196.026 At	-0.2	-0.000397	mg/L	0.0046842	-0.000397	mg/L	0.0046842	>999.9%
QC value within limits for Se 196.026 A Recovery = Not calculated								
Si 251.611 Rt	84.8	0.063306	mg/L	0.0022011	0.063306	mg/L	0.0022011	3.48%
QC value greater than the upper limit for Si 251.611 R Recovery = Not calculated								
SIO2 251.611 Rt	84.8	0.135476	mg/L	0.0047102	0.135476	mg/L	0.0047102	3.48%

94

QC value greater than the upper limit for SIO2 251.611 R Recovery = Not calculated

Sn 189.927 A†	-3.1	-0.001284 mg/L	0.0006055	-0.001284 mg/L	0.0006055	47.14%
QC value within limits for Sn 189.927 A Recovery = Not calculated						
Sr 421.552 R†	78.2	0.000110 mg/L	0.0000300	0.000110 mg/L	0.0000300	27.32%
QC value within limits for Sr 421.552 R Recovery = Not calculated						
Ti 336.121 A†	28.2	0.000102 mg/L	0.0000456	0.000102 mg/L	0.0000456	44.74%
QC value within limits for Ti 336.121 A Recovery = Not calculated						
Tl 190.801 A†	0.1	0.000197 mg/L	0.0049439	0.000197 mg/L	0.0049439	>999.9%
QC value within limits for Tl 190.801 A Recovery = Not calculated						
U 385.958 A†	15.3	0.000879 mg/L	0.0008723	0.000879 mg/L	0.0008723	99.29%
V 292.402 A†	-6.6	-0.000071 mg/L	0.0001486	-0.000071 mg/L	0.0001486	209.73%
QC value within limits for V 292.402 A Recovery = Not calculated						
Zn 206.200 A†	-2.3	-0.000266 mg/L	0.0000786	-0.000266 mg/L	0.0000786	29.58%
QC value within limits for Zn 206.200 A Recovery = Not calculated						

QC Failed. Continue with analysis.

 95

Analysis Begun

Start Time: 4/27/2009 10:04:04 AM
Logged In Analyst: Optima5
Spectrometer Model: Optima 5300 DV, S/N 077N5011902
Plasma On Time: 4/27/2009 6:27:37 AM
Technique: ICP Continuous
Autosampler Model: AS-93plus

Sample Information File: C:\pe\Administrator\Sample Information\START.sif
Batch ID: W916298
Results Data Set: 09117A
Results Library: C:\pe\Administrator\Results\Results.mdb

Method Loaded
Method Name: OPT5
IEC File: OPTIMA5.iec
Method Description:
Method Last Saved: 4/27/2009 8:45:16 AM
MSF File:

Sequence No.: 1
Sample ID: ~~W916298 BLK1~~ KG 4/24/09
Analyst:
Initial Sample Wt:
Dilution:
Autosampler Location: 38
Date Collected: 4/27/2009 10:04:07 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ~~W916298 BLK1~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	122546.6	97.9555	%	0.48594				0.50%
Lu 261.542 A	2342989.1	98.6183	%	0.42549				0.43%
Ag 328.068 At	-22.4	-0.000166	mg/L	0.0000791	-0.000166	mg/L	0.0000791	47.73%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	2.0	0.001619	mg/L	0.0031006	0.001619	mg/L	0.0031006	191.51%
QC value within limits for Al 308.215 R Recovery = Not calculated								
As 188.979 At	-3.6	-0.004541	mg/L	0.0035039	-0.004541	mg/L	0.0035039	77.16%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	5.4	0.002893	mg/L	0.0019551	0.002893	mg/L	0.0019551	67.58%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	-2.3	-0.000058	mg/L	0.0000184	-0.000058	mg/L	0.0000184	31.85%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	3.1	0.000023	mg/L	0.0000066	0.000023	mg/L	0.0000066	28.40%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	7.9	0.007350	mg/L	0.0013256	0.007350	mg/L	0.0013256	18.04%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	6.8	0.001959	mg/L	0.0015754	0.001959	mg/L	0.0015754	80.43%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	1.0	0.000030	mg/L	0.0000295	0.000030	mg/L	0.0000295	99.56%
QC value within limits for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	-11.2	-0.000184	mg/L	0.0002543	-0.000184	mg/L	0.0002543	138.19%
Co 228.616 At	-0.2	-0.000013	mg/L	0.0003224	-0.000013	mg/L	0.0003224	>999.9%
QC value within limits for Co 228.616 A Recovery = Not calculated								
Cr 267.716 At	-0.5	-0.000013	mg/L	0.0000320	-0.000013	mg/L	0.0000320	241.65%
QC value within limits for Cr 267.716 A Recovery = Not calculated								
Cu 324.752 At	-275.6	-0.001642	mg/L	0.0000735	-0.001642	mg/L	0.0000735	4.48%
QC value within limits for Cu 324.752 A Recovery = Not calculated								
Fe 273.955 Rt	-0.9	-0.001667	mg/L	0.0022628	-0.001667	mg/L	0.0022628	135.77%
QC value within limits for Fe 273.955 R Recovery = Not calculated								
Ga 417.206 At	10.4	0.000128	mg/L	0.0000082	0.000128	mg/L	0.0000082	6.36%
QC value within limits for Ga 417.206 A Recovery = Not calculated								
K 766.490 Rt	-18.3	-0.007369	mg/L	0.0020850	-0.007369	mg/L	0.0020850	28.29%
QC value within limits for K 766.490 R Recovery = Not calculated								
La 379.478 At	-1.3	-0.000005	mg/L	0.0000783	-0.000005	mg/L	0.0000783	>999.9%
QC value within limits for La 379.478 A Recovery = Not calculated								
Li 670.784 Rt	-64.6	-0.000599	mg/L	0.0000282	-0.000599	mg/L	0.0000282	4.70%
QC value within limits for Li 670.784 R Recovery = Not calculated								
Mg 279.077 Rt	1.3	0.002729	mg/L	0.0085193	0.002729	mg/L	0.0085193	312.22%
QC value within limits for Mg 279.077 R Recovery = Not calculated								
Mn 260.568 Rt	-2.6	-0.000203	mg/L	0.0001416	-0.000203	mg/L	0.0001416	69.62%
QC value within limits for Mn 260.568 R Recovery = Not calculated								
Mo 202.031 At	2.1	0.000271	mg/L	0.0002897	0.000271	mg/L	0.0002897	107.01%

QC value within limits for Mo 202.031 A Recovery = Not calculated

Na 589.592 R†	-393.8	-0.055578	mg/L	0.0019061	-0.055578	mg/L	0.0019061 3.43%

QC value within limits for Na 589.592 R Recovery = Not calculated

Ni 232.003 A†	-5.9	-0.000603	mg/L	0.0004812	-0.000603	mg/L	0.0004812 79.87%

QC value within limits for Ni 232.003 A Recovery = Not calculated

P 213.617 A†	0.1	0.000148	mg/L	0.0023023	0.000148	mg/L	0.0023023 >999.9%

QC value within limits for P 213.617 A Recovery = Not calculated

Pb 220.353 A†	-2.0	-0.000561	mg/L	0.0010497	-0.000561	mg/L	0.0010497 187.08%

QC value within limits for Pb 220.353 A Recovery = Not calculated

Sb 206.836 A†	2.4	0.001432	mg/L	0.0026631	0.001432	mg/L	0.0026631 185.97%

QC value within limits for Sb 206.836 A Recovery = Not calculated

Sc 361.383 A†	18.6	0.000016	mg/L	0.0000010	0.000016	mg/L	0.0000010 6.65%

QC value within limits for Sc 361.383 A Recovery = Not calculated

Se 196.026 A†	-3.0	-0.006821	mg/L	0.0011231	-0.006821	mg/L	0.0011231 16.47%

QC value within limits for Se 196.026 A Recovery = Not calculated

Si 251.611 R†	37.0	0.027668	mg/L	0.0017934	0.027668	mg/L	0.0017934 6.48%

QC value within limits for Si 251.611 R Recovery = Not calculated

SIO2 251.611 R†	37.0	0.059209	mg/L	0.0038383	0.059209	mg/L	0.0038383 6.48%

QC value within limits for SIO2 251.611 R Recovery = Not calculated

Sn 189.927 A†	-3.9	-0.001622	mg/L	0.0004706	-0.001622	mg/L	0.0004706 29.02%

QC value within limits for Sn 189.927 A Recovery = Not calculated

Sr 421.552 R†	-18.8	-0.000026	mg/L	0.0000124	-0.000026	mg/L	0.0000124 47.01%

QC value within limits for Sr 421.552 R Recovery = Not calculated

Ti 336.121 A†	-35.2	-0.000143	mg/L	0.0000628	-0.000143	mg/L	0.0000628 43.82%

QC value within limits for Ti 336.121 A Recovery = Not calculated

Tl 190.801 A†	-0.0	-0.000031	mg/L	0.0014425	-0.000031	mg/L	0.0014425 >999.9%

QC value within limits for Tl 190.801 A Recovery = Not calculated

U 385.958 A†	4.8	0.000278	mg/L	0.0004617	0.000278	mg/L	0.0004617 166.14%
V 292.402 A†	3.9	0.000051	mg/L	0.0000160	0.000051	mg/L	0.0000160 31.47%

QC value within limits for V 292.402 A Recovery = Not calculated

Zn 206.200 A†	5.5	0.000619	mg/L	0.0000373	0.000619	mg/L	0.0000373 6.02%

QC value within limits for Zn 206.200 A Recovery = Not calculated

All analyte(s) passed QC.

97

Sequence No.: 2 ZZZZZ
Sample ID: ~~W916298-BS1~~ KG 4/29/09
Analyst:
Initial Sample Wt:
Dilution:
ZZZZZ

Autosampler Location: 39
Date Collected: 4/27/2009 10:09:53 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ~~W916298-BS1~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	120561.0	96.3684	%	1.02159				1.06%
Lu 261.542 A	2280141.2	95.9730	%	0.04980				0.05%
Ag 328.068 At	6512.7	0.048493	mg/L	0.0004371	0.048493	mg/L	0.0004371	0.90%
QC value within limits for Ag 328.068 A Recovery = 96.99%								
Al 308.215 Rt	1246.8	0.995798	mg/L	0.0015241	0.995798	mg/L	0.0015241	0.15%
QC value within limits for Al 308.215 R Recovery = 99.58%								
As 188.979 At	762.1	0.917753	mg/L	0.0000632	0.917753	mg/L	0.0000632	0.01%
QC value within limits for As 188.979 A Recovery = 91.78%								
B 249.677 Rt	1788.7	0.959429	mg/L	0.0078258	0.959429	mg/L	0.0078258	0.82%
QC value within limits for B 249.677 R Recovery = 95.94%								
Ba 233.527 At	38057.7	0.960543	mg/L	0.0038471	0.960543	mg/L	0.0038471	0.40%
QC value within limits for Ba 233.527 A Recovery = 96.05%								
Be 313.107 Rt	124142.1	0.929641	mg/L	0.0006534	0.929641	mg/L	0.0006534	0.07%
QC value within limits for Be 313.107 R Recovery = 92.96%								
Bi 222.821 At	1051.7	0.905982	mg/L	0.0023123	0.905982	mg/L	0.0023123	0.26%
QC value within limits for Bi 222.821 A Recovery = 90.60%								
Ca 315.887 Rt	66215.1	19.0798	mg/L	0.10013	19.0798	mg/L	0.10013	0.52%
QC value within limits for Ca 315.887 R Recovery = 95.40%								
Cd 226.502 At	30239.2	0.936315	mg/L	0.0051520	0.936315	mg/L	0.0051520	0.55%
QC value within limits for Cd 226.502 A Recovery = 93.63%								
Ce 418.660 At	-170.6	0.000224	mg/L	0.0003921	0.000224	mg/L	0.0003921	175.14%
Co 228.616 At	15282.1	0.935809	mg/L	0.0030742	0.935809	mg/L	0.0030742	0.33%
QC value within limits for Co 228.616 A Recovery = 93.58%								
Cr 267.716 At	35641.6	0.947626	mg/L	0.0043588	0.947626	mg/L	0.0043588	0.46%
QC value within limits for Cr 267.716 A Recovery = 94.76%								
Cu 324.752 At	158046.4	0.942019	mg/L	0.0017277	0.942019	mg/L	0.0017277	0.18%
QC value within limits for Cu 324.752 A Recovery = 94.20%								
Fe 273.955 Rt	5276.4	9.31067	mg/L	0.079078	9.31067	mg/L	0.079078	0.85%
QC value within limits for Fe 273.955 R Recovery = 93.11%								
Ga 417.206 At	77452.6	0.912080	mg/L	0.0007673	0.912080	mg/L	0.0007673	0.08%
QC value within limits for Ga 417.206 A Recovery = 91.21%								
K 766.490 Rt	46691.1	18.8265	mg/L	0.07687	18.8265	mg/L	0.07687	0.41%
QC value within limits for K 766.490 R Recovery = 94.13%								
La 379.478 At	202624.9	0.947007	mg/L	0.0008709	0.947007	mg/L	0.0008709	0.09%
QC value within limits for La 379.478 A Recovery = 94.70%								
Li 670.784 Rt	99841.7	0.925701	mg/L	0.0012828	0.925701	mg/L	0.0012828	0.14%
QC value within limits for Li 670.784 R Recovery = 92.57%								
Mg 279.077 Rt	9516.3	19.3156	mg/L	0.18594	19.3156	mg/L	0.18594	0.96%
QC value within limits for Mg 279.077 R Recovery = 96.58%								
Mn 260.568 Rt	12137.1	0.937936	mg/L	0.0056926	0.937936	mg/L	0.0056926	0.61%
QC value within limits for Mn 260.568 R Recovery = 93.79%								
Mo 202.031 At	7530.8	0.955214	mg/L	0.0038411	0.955214	mg/L	0.0038411	0.40%
QC value within limits for Mo 202.031 A Recovery = 95.52%								
Na 589.592 Rt	129911.5	18.3354	mg/L	0.07464	18.3354	mg/L	0.07464	0.41%
QC value within limits for Na 589.592 R Recovery = 96.50%								
Ni 232.003 At	8922.4	0.896406	mg/L	0.0048636	0.896406	mg/L	0.0048636	0.54%
QC value within limits for Ni 232.003 A Recovery = 89.64%								
P 213.617 At	1415.9	0.915206	mg/L	0.0013800	0.915206	mg/L	0.0013800	0.15%
QC value within limits for P 213.617 A Recovery = 91.52%								
Pb 220.353 At	3284.0	0.937788	mg/L	0.0022364	0.937788	mg/L	0.0022364	0.24%
QC value within limits for Pb 220.353 A Recovery = 93.78%								
Sb 206.836 At	1486.9	0.909409	mg/L	0.0047615	0.909409	mg/L	0.0047615	0.52%
QC value within limits for Sb 206.836 A Recovery = 90.94%								
Sc 361.383 At	555690.5	0.461198	mg/L	0.0004865	0.461198	mg/L	0.0004865	0.11%
QC value within limits for Sc 361.383 A Recovery = 92.24%								
Se 196.026 At	382.1	0.880852	mg/L	0.0020419	0.880852	mg/L	0.0020419	0.23%
QC value within limits for Se 196.026 A Recovery = 88.09%								
Si 251.611 Rt	6563.5	4.84899	mg/L	0.036390	4.84899	mg/L	0.036390	0.75%
QC value within limits for Si 251.611 R Recovery = 96.98%								
SIO2 251.611 Rt	6563.5	10.3776	mg/L	0.07788	10.3776	mg/L	0.07788	0.75%

98

QC value within limits for SIO2 251.611 R Recovery = 96.99%

Sn 189.927 A†	2231.3	0.918825 mg/L	0.0016192	0.918825 mg/L	0.0016192	0.18%

QC value within limits for Sn 189.927 A Recovery = 91.88%

Sr 421.552 R†	654999.3	0.919068 mg/L	0.0022133	0.919068 mg/L	0.0022133	0.24%

QC value within limits for Sr 421.552 R Recovery = 91.91%

Ti 336.121 A†	262670.6	0.948345 mg/L	0.0011016	0.948345 mg/L	0.0011016	0.12%

QC value within limits for Ti 336.121 A Recovery = 94.83%

Tl 190.801 A†	685.5	0.923789 mg/L	0.0025180	0.923789 mg/L	0.0025180	0.27%

QC value within limits for Tl 190.801 A Recovery = 92.38%

U 385.958 A†	1150.0	-0.003659 mg/L	0.0002198	-0.003659 mg/L	0.0002198	6.01%

QC value less than the lower limit for U 385.958 A Recovery = -0.37%

V 292.402 A†	77005.9	0.957037 mg/L	0.0057866	0.957037 mg/L	0.0057866	0.60%

QC value within limits for V 292.402 A Recovery = 95.70%

Zn 206.200 A†	8331.5	0.941052 mg/L	0.0011017	0.941052 mg/L	0.0011017	0.12%

QC value within limits for Zn 206.200 A Recovery = 94.11%

QC Failed. Continue with analysis.

Sequence No.: 3
Sample ID: ~~W9D0212-01~~ KG 4/24/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 40
Date Collected: 4/27/2009 10:15:50 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ~~W9D0212-01~~ KG 4/24/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	124280.1	99.3412	%	0.14933				0.15%
Lu 261.542 A	2367628.3	99.6554	%	0.51854				0.52%
Ag 328.068 At	-23.5	-0.000175	mg/L	0.0000341	-0.000175	mg/L	0.0000341	19.50%
Al 308.215 Rt	7.8	0.006174	mg/L	0.0012769	0.006174	mg/L	0.0012769	20.68%
As 188.979 At	-1.4	-0.001741	mg/L	0.0006720	-0.001741	mg/L	0.0006720	38.61%
B 249.677 Rt	14.5	0.007756	mg/L	0.0003974	0.007756	mg/L	0.0003974	5.12%
Ba 233.527 At	435.1	0.010987	mg/L	0.0000894	0.010987	mg/L	0.0000894	0.81%
Be 313.107 Rt	1.2	0.000009	mg/L	0.0000229	0.000009	mg/L	0.0000229	247.63%
Bi 222.821 At	-6.8	0.001309	mg/L	0.0005605	0.001309	mg/L	0.0005605	42.83%
Ca 315.887 Rt	219927.6	63.3854	mg/L	0.07585	63.3854	mg/L	0.07585	0.12%
Cd 226.502 At	12.9	0.000401	mg/L	0.0002199	0.000401	mg/L	0.0002199	54.85%
Ce 418.660 At	29.1	0.000484	mg/L	0.0000748	0.000484	mg/L	0.0000748	15.46%
Co 228.616 At	-2.7	-0.000167	mg/L	0.0000139	-0.000167	mg/L	0.0000139	8.30%
Cr 267.716 At	4.5	0.000068	mg/L	0.0000780	0.000068	mg/L	0.0000780	114.17%
Cu 324.752 At	-329.3	-0.001969	mg/L	0.0000024	-0.001969	mg/L	0.0000024	0.12%
Fe 273.955 Rt	-0.7	-0.001518	mg/L	0.0037054	-0.001518	mg/L	0.0037054	244.02%
Ga 417.206 At	1.7	-0.000003	mg/L	0.0000933	-0.000003	mg/L	0.0000933	>999.9%
K 766.490 Rt	3478.4	1.40254	mg/L	0.004472	1.40254	mg/L	0.004472	0.32%
La 379.478 At	83.9	0.000304	mg/L	0.0000427	0.000304	mg/L	0.0000427	14.06%
Li 670.784 Rt	38.8	0.000360	mg/L	0.0000759	0.000360	mg/L	0.0000759	21.07%
Mg 279.077 Rt	3838.3	7.78963	mg/L	0.009994	7.78963	mg/L	0.009994	0.13%
Mn 260.568 Rt	2.6	-0.000056	mg/L	0.0000144	-0.000056	mg/L	0.0000144	25.72%
Mo 202.031 At	67.6	0.007641	mg/L	0.0003439	0.007641	mg/L	0.0003439	4.50%
Na 589.592 Rt	37671.7	5.31690	mg/L	0.032773	5.31690	mg/L	0.032773	0.62%
Ni 232.003 At	-7.6	0.000319	mg/L	0.0002420	0.000319	mg/L	0.0002420	75.77%
P 213.617 At	6.5	0.004386	mg/L	0.0020708	0.004386	mg/L	0.0020708	47.22%
Pb 220.353 At	3.2	0.002253	mg/L	0.0003115	0.002253	mg/L	0.0003115	13.83%
Sb 206.836 At	3.6	0.002245	mg/L	0.0004467	0.002245	mg/L	0.0004467	19.90%
Sc 361.383 At	-185.7	-0.000157	mg/L	0.0000126	-0.000157	mg/L	0.0000126	8.04%
Se 196.026 At	6.3	0.013645	mg/L	0.0013275	0.013645	mg/L	0.0013275	9.73%
Si 251.611 Rt	13126.7	9.79652	mg/L	0.017369	9.79652	mg/L	0.017369	0.18%
SIO2 251.611 Rt	13126.7	20.9646	mg/L	0.03717	20.9646	mg/L	0.03717	0.18%
Sn 189.927 At	-14.6	-0.004571	mg/L	0.0004066	-0.004571	mg/L	0.0004066	8.90%
Sr 421.552 Rt	174198.3	0.243711	mg/L	0.0002484	0.243711	mg/L	0.0002484	0.10%
Ti 336.121 At	172.2	0.000249	mg/L	0.0000090	0.000249	mg/L	0.0000090	3.60%
Tl 190.801 At	2.1	0.002736	mg/L	0.0003615	0.002736	mg/L	0.0003615	13.21%
U 385.958 At	135.2	0.006053	mg/L	0.0004871	0.006053	mg/L	0.0004871	8.05%
V 292.402 At	80.9	0.001094	mg/L	0.0001958	0.001094	mg/L	0.0001958	17.90%
Zn 206.200 At	-14.6	-0.001733	mg/L	0.0001385	-0.001733	mg/L	0.0001385	8.00%

100

Sequence No.: 4 ZZZZZ
Sample ID: ~~W9D0212-02~~ KG 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 41
Date Collected: 4/27/2009 10:21:36 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

ZZZZZ

Mean Data: ~~W9D0212-02~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	126286.1	100.945	%	0.2879				0.29%
Lu 261.542 A	2361316.7	99.3897	%	0.30981				0.31%
Ag 328.068 At	-37.2	-0.000273	mg/L	0.0000982	-0.000273	mg/L	0.0000982	35.94%
Al 308.215 Rt	8.7	0.006898	mg/L	0.0001756	0.006898	mg/L	0.0001756	2.55%
As 188.979 At	-1.0	-0.001184	mg/L	0.0029750	-0.001184	mg/L	0.0029750	251.37%
B 249.677 Rt	11.0	0.005892	mg/L	0.0010628	0.005892	mg/L	0.0010628	18.04%
Ba 233.527 At	423.1	0.010683	mg/L	0.0000554	0.010683	mg/L	0.0000554	0.52%
Be 313.107 Rt	-6.6	-0.000049	mg/L	0.0000087	-0.000049	mg/L	0.0000087	17.53%
Bi 222.821 At	-1.1	0.005860	mg/L	0.0002545	0.005860	mg/L	0.0002545	4.34%
Ca 315.887 Rt	215254.0	62.0381	mg/L	0.31245	62.0381	mg/L	0.31245	0.50%
Cd 226.502 At	5.0	0.000156	mg/L	0.0000343	0.000156	mg/L	0.0000343	21.97%
Ce 418.660 At	69.0	0.001141	mg/L	0.0004361	0.001141	mg/L	0.0004361	38.23%
Co 228.616 At	-3.9	-0.000243	mg/L	0.0003311	-0.000243	mg/L	0.0003311	136.13%
Cr 267.716 At	12.1	0.000264	mg/L	0.0002333	0.000264	mg/L	0.0002333	88.48%
Cu 324.752 At	-351.3	-0.002099	mg/L	0.0001405	-0.002099	mg/L	0.0001405	6.69%
Fe 273.955 Rt	-0.6	-0.001431	mg/L	0.0005340	-0.001431	mg/L	0.0005340	37.32%
Ga 417.206 At	-1.5	-0.000054	mg/L	0.0000762	-0.000054	mg/L	0.0000762	140.02%
K 766.490 Rt	4029.3	1.62468	mg/L	0.001160	1.62468	mg/L	0.001160	0.07%
La 379.478 At	77.8	0.000272	mg/L	0.0001166	0.000272	mg/L	0.0001166	42.91%
Li 670.784 Rt	17.4	0.000161	mg/L	0.0001082	0.000161	mg/L	0.0001082	67.22%
Mg 279.077 Rt	4271.0	8.66794	mg/L	0.026568	8.66794	mg/L	0.026568	0.31%
Mn 260.568 Rt	17.6	0.001076	mg/L	0.0000319	0.001076	mg/L	0.0000319	2.96%
Mo 202.031 At	69.5	0.007900	mg/L	0.0005489	0.007900	mg/L	0.0005489	6.95%
Na 589.592 Rt	50581.9	7.13902	mg/L	0.056263	7.13902	mg/L	0.056263	0.79%
Ni 232.003 At	-16.0	-0.000666	mg/L	0.0003748	-0.000666	mg/L	0.0003748	56.28%
P 213.617 At	19.6	0.012937	mg/L	0.0021828	0.012937	mg/L	0.0021828	16.87%
Pb 220.353 At	-3.1	0.000354	mg/L	0.0005291	0.000354	mg/L	0.0005291	149.34%
Sb 206.836 At	-0.3	-0.000124	mg/L	0.0000357	-0.000124	mg/L	0.0000357	28.89%
Sc 361.383 At	-199.0	-0.000169	mg/L	0.0000001	-0.000169	mg/L	0.0000001	0.07%
Se 196.026 At	4.7	0.009966	mg/L	0.0032577	0.009966	mg/L	0.0032577	32.69%
Si 251.611 Rt	11804.7	8.80955	mg/L	0.022734	8.80955	mg/L	0.022734	0.26%
SIO2 251.611 Rt	11804.7	18.8525	mg/L	0.04865	18.8525	mg/L	0.04865	0.26%
Sn 189.927 At	-13.8	-0.004260	mg/L	0.0017845	-0.004260	mg/L	0.0017845	41.89%
Sr 421.552 Rt	218804.9	0.306334	mg/L	0.0012612	0.306334	mg/L	0.0012612	0.41%
Ti 336.121 At	157.0	0.000201	mg/L	0.0000284	0.000201	mg/L	0.0000284	14.13%
Tl 190.801 At	1.4	0.001895	mg/L	0.0026479	0.001895	mg/L	0.0026479	139.70%
U 385.958 At	110.3	0.004655	mg/L	0.0004422	0.004655	mg/L	0.0004422	9.50%
V 292.402 At	145.0	0.001882	mg/L	0.0000065	0.001882	mg/L	0.0000065	0.34%
Zn 206.200 At	-16.8	-0.002002	mg/L	0.0001796	-0.002002	mg/L	0.0001796	8.97%

Sequence No.: 5
Sample ID: ~~W9D0212-03~~ KS 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 42
Date Collected: 4/27/2009 10:27:20 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ~~W9D0212-03~~ KS 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	124543.0	99.5513	%	0.43786				0.44%
Lu 261.542 A	2338537.8	98.4309	%	0.21575				0.22%
Ag 328.068 At	-36.1	-0.000266	mg/L	0.0001116	-0.000266	mg/L	0.0001116	42.02%
Al 308.215 Rt	9.0	0.007292	mg/L	0.0013947	0.007292	mg/L	0.0013947	19.13%
As 188.979 At	-2.4	-0.002877	mg/L	0.0045278	-0.002877	mg/L	0.0045278	157.37%
B 249.677 Rt	76.2	0.040845	mg/L	0.0009525	0.040845	mg/L	0.0009525	2.33%
Ba 233.527 At	559.4	0.014123	mg/L	0.0000002	0.014123	mg/L	0.0000002	0.00%
Be 313.107 Rt	-5.0	-0.000037	mg/L	0.0000048	-0.000037	mg/L	0.0000048	12.98%
Bi 222.821 At	-3.4	0.003671	mg/L	0.0013171	0.003671	mg/L	0.0013171	35.88%
Ca 315.887 Rt	183710.1	52.9408	mg/L	0.18699	52.9408	mg/L	0.18699	0.35%
Cd 226.502 At	0.6	0.000021	mg/L	0.0001672	0.000021	mg/L	0.0001672	783.90%
Ce 418.660 At	57.6	0.000945	mg/L	0.0002197	0.000945	mg/L	0.0002197	23.26%
Co 228.616 At	0.2	0.000011	mg/L	0.0000413	0.000011	mg/L	0.0000413	387.87%
Cr 267.716 At	-0.4	-0.000065	mg/L	0.0002202	-0.000065	mg/L	0.0002202	339.82%
Cu 324.752 At	-278.1	-0.001662	mg/L	0.0000327	-0.001662	mg/L	0.0000327	1.97%
Fe 273.955 Rt	-3.5	-0.006569	mg/L	0.0038033	-0.006569	mg/L	0.0038033	57.90%
Ga 417.206 At	-0.2	-0.000033	mg/L	0.0000248	-0.000033	mg/L	0.0000248	74.59%
K 766.490 Rt	6268.2	2.52745	mg/L	0.006978	2.52745	mg/L	0.006978	0.28%
La 379.478 At	79.6	0.000296	mg/L	0.0000063	0.000296	mg/L	0.0000063	2.13%
Li 670.784 Rt	-19.7	-0.000183	mg/L	0.0000801	-0.000183	mg/L	0.0000801	43.83%
Mg 279.077 Rt	4086.0	8.29261	mg/L	0.024893	8.29261	mg/L	0.024893	0.30%
Mn 260.568 Rt	3.1	-0.000029	mg/L	0.0000787	-0.000029	mg/L	0.0000787	269.92%
Mo 202.031 At	40.5	0.004363	mg/L	0.0003021	0.004363	mg/L	0.0003021	6.92%
Na 589.592 Rt	310831.7	43.8702	mg/L	0.09265	43.8702	mg/L	0.09265	0.21%
Ni 232.003 At	-11.0	-0.000135	mg/L	0.0004907	-0.000135	mg/L	0.0004907	363.13%
P 213.617 At	27.0	0.017738	mg/L	0.0020321	0.017738	mg/L	0.0020321	11.46%
Pb 220.353 At	2.3	0.001831	mg/L	0.0008773	0.001831	mg/L	0.0008773	47.92%
Sb 206.836 At	3.6	0.002183	mg/L	0.0008055	0.002183	mg/L	0.0008055	36.89%
Sc 361.383 At	-173.3	-0.000146	mg/L	0.0000124	-0.000146	mg/L	0.0000124	8.52%
Se 196.026 At	4.2	0.008760	mg/L	0.0032709	0.008760	mg/L	0.0032709	37.34%
Si 251.611 Rt	11758.0	8.77483	mg/L	0.023036	8.77483	mg/L	0.023036	0.26%
SIO2 251.611 Rt	11758.0	18.7782	mg/L	0.04930	18.7782	mg/L	0.04930	0.26%
Sn 189.927 At	-13.0	-0.004140	mg/L	0.0004459	-0.004140	mg/L	0.0004459	10.77%
Sr 421.552 Rt	111800.9	0.156263	mg/L	0.0006800	0.156263	mg/L	0.0006800	0.44%
Ti 336.121 At	157.6	0.000267	mg/L	0.0000661	0.000267	mg/L	0.0000661	24.80%
Tl 190.801 At	1.8	0.002344	mg/L	0.0029124	0.002344	mg/L	0.0029124	124.24%
U 385.958 At	112.2	0.005027	mg/L	0.0005356	0.005027	mg/L	0.0005356	10.65%
V 292.402 At	80.0	0.001048	mg/L	0.0000915	0.001048	mg/L	0.0000915	8.73%
Zn 206.200 At	-14.7	-0.001776	mg/L	0.0001033	-0.001776	mg/L	0.0001033	5.81%

102

Sequence No.: 6
Sample ID: ~~W9D0212-04~~ KG 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 43
Date Collected: 4/27/2009 10:33:29 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ~~W9D0212-04~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	123654.9	98.8414	%	0.91363				0.92%
Lu 261.542 A	2345020.2	98.7038	%	0.21111				0.21%
Ag 328.068 At	-16.6	-0.000124	mg/L	0.0001344	-0.000124	mg/L	0.0001344	108.60%
Al 308.215 Rt	5.4	0.004160	mg/L	0.0019931	0.004160	mg/L	0.0019931	47.91%
As 188.979 At	2.4	0.003032	mg/L	0.0018862	0.003032	mg/L	0.0018862	62.20%
B 249.677 Rt	9.9	0.005301	mg/L	0.0004179	0.005301	mg/L	0.0004179	7.88%
Ba 233.527 At	82.2	0.002078	mg/L	0.0000228	0.002078	mg/L	0.0000228	1.10%
Be 313.107 Rt	-3.3	-0.000025	mg/L	0.0000127	-0.000025	mg/L	0.0000127	50.57%
Bi 222.821 At	-1.4	0.005228	mg/L	0.0013922	0.005228	mg/L	0.0013922	26.63%
Ca 315.887 Rt	194031.3	55.9220	mg/L	0.15189	55.9220	mg/L	0.15189	0.27%
Cd 226.502 At	0.5	0.000019	mg/L	0.0000395	0.000019	mg/L	0.0000395	204.06%
Ce 418.660 At	31.4	0.000528	mg/L	0.0001878	0.000528	mg/L	0.0001878	35.54%
Co 228.616 At	-3.9	-0.000241	mg/L	0.0001297	-0.000241	mg/L	0.0001297	53.90%
Cr 267.716 At	-5.0	-0.000173	mg/L	0.0000101	-0.000173	mg/L	0.0000101	5.82%
Cu 324.752 At	-311.2	-0.001861	mg/L	0.0000012	-0.001861	mg/L	0.0000012	0.06%
Fe 273.955 Rt	-3.5	-0.006449	mg/L	0.0025643	-0.006449	mg/L	0.0025643	39.76%
Ga 417.206 At	-10.2	-0.000142	mg/L	0.0000065	-0.000142	mg/L	0.0000065	4.54%
K 766.490 Rt	3103.8	1.25149	mg/L	0.001839	1.25149	mg/L	0.001839	0.15%
La 379.478 At	101.3	0.000395	mg/L	0.0000842	0.000395	mg/L	0.0000842	21.29%
Li 670.784 Rt	179.7	0.001666	mg/L	0.0001832	0.001666	mg/L	0.0001832	11.00%
Mg 279.077 Rt	2973.8	6.03502	mg/L	0.000554	6.03502	mg/L	0.000554	0.01%
Mn 260.568 Rt	-1.2	-0.000287	mg/L	0.0000071	-0.000287	mg/L	0.0000071	2.48%
Mo 202.031 At	84.6	0.009904	mg/L	0.0003663	0.009904	mg/L	0.0003663	3.70%
Na 589.592 Rt	24046.7	3.39390	mg/L	0.033498	3.39390	mg/L	0.033498	0.99%
Ni 232.003 At	-14.9	-0.000613	mg/L	0.0003781	-0.000613	mg/L	0.0003781	61.63%
P 213.617 At	7.0	0.004677	mg/L	0.0026862	0.004677	mg/L	0.0026862	57.43%
Pb 220.353 At	0.6	0.001309	mg/L	0.0007568	0.001309	mg/L	0.0007568	57.83%
Sb 206.836 At	3.1	0.001911	mg/L	0.0008011	0.001911	mg/L	0.0008011	41.93%
Sc 361.383 At	-187.7	-0.000157	mg/L	0.0000006	-0.000157	mg/L	0.0000006	0.40%
Se 196.026 At	6.3	0.013971	mg/L	0.0041335	0.013971	mg/L	0.0041335	29.59%
Si 251.611 Rt	11129.6	8.30610	mg/L	0.040401	8.30610	mg/L	0.040401	0.49%
SIO2 251.611 Rt	11129.6	17.7751	mg/L	0.08646	17.7751	mg/L	0.08646	0.49%
Sn 189.927 At	-15.9	-0.005292	mg/L	0.0011637	-0.005292	mg/L	0.0011637	21.99%
Sr 421.552 Rt	112665.4	0.157440	mg/L	0.0003395	0.157440	mg/L	0.0003395	0.22%
Ti 336.121 At	127.7	0.000127	mg/L	0.0000021	0.000127	mg/L	0.0000021	1.68%
Tl 190.801 At	-0.8	-0.001131	mg/L	0.0011747	-0.001131	mg/L	0.0011747	103.86%
U 385.958 At	129.0	0.005919	mg/L	0.0008902	0.005919	mg/L	0.0008902	15.04%
V 292.402 At	133.0	0.001754	mg/L	0.0002024	0.001754	mg/L	0.0002024	11.54%
Zn 206.200 At	-16.3	-0.001924	mg/L	0.0000608	-0.001924	mg/L	0.0000608	3.16%

Sequence No.: 7 ZZZZZ
Sample ID: ~~W9D0212-06~~ KG 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 44
Date Collected: 4/27/2009 10:39:17 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

ZZZZZ

Mean Data: ~~W9D0212-06~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	125163.1	100.047	%	0.0115				0.01%
Lu 261.542 A	2349710.5	98.9012	%	0.10448				0.11%
Ag 328.068 At	-25.7	-0.000190	mg/L	0.0000672	-0.000190	mg/L	0.0000672	35.39%
Al 308.215 Rt	5.7	0.004486	mg/L	0.0002295	0.004486	mg/L	0.0002295	5.12%
As 188.979 At	-1.2	-0.001464	mg/L	0.0015353	-0.001464	mg/L	0.0015353	104.85%
B 249.677 Rt	10.6	0.005679	mg/L	0.0011942	0.005679	mg/L	0.0011942	21.03%
Ba 233.527 At	432.5	0.010921	mg/L	0.0000478	0.010921	mg/L	0.0000478	0.44%
Be 313.107 Rt	-3.2	-0.000024	mg/L	0.0000322	-0.000024	mg/L	0.0000322	136.39%
Bi 222.821 At	-7.9	0.000232	mg/L	0.0010270	0.000232	mg/L	0.0010270	443.56%
Ca 315.887 Rt	220784.5	63.6324	mg/L	0.23379	63.6324	mg/L	0.23379	0.37%
Cd 226.502 At	-5.6	-0.000171	mg/L	0.0001270	-0.000171	mg/L	0.0001270	74.28%
Ce 418.660 At	52.0	0.000858	mg/L	0.0004323	0.000858	mg/L	0.0004323	50.36%
Co 228.616 At	-3.3	-0.000207	mg/L	0.0001530	-0.000207	mg/L	0.0001530	74.04%
Cr 267.716 At	3.9	0.000053	mg/L	0.0002053	0.000053	mg/L	0.0002053	385.41%
Cu 324.752 At	-400.0	-0.002389	mg/L	0.0000554	-0.002389	mg/L	0.0000554	2.32%
Fe 273.955 Rt	-1.3	-0.002702	mg/L	0.0006459	-0.002702	mg/L	0.0006459	23.91%
Ga 417.206 At	5.5	0.000035	mg/L	0.0000262	0.000035	mg/L	0.0000262	74.83%
K 766.490 Rt	3491.7	1.40790	mg/L	0.002412	1.40790	mg/L	0.002412	0.17%
La 379.478 At	93.6	0.000347	mg/L	0.0000551	0.000347	mg/L	0.0000551	15.87%
Li 670.784 Rt	34.7	0.000322	mg/L	0.0001421	0.000322	mg/L	0.0001421	44.16%
Mg 279.077 Rt	3831.1	7.77504	mg/L	0.019823	7.77504	mg/L	0.019823	0.25%
Mn 260.568 Rt	0.1	-0.000249	mg/L	0.0002310	-0.000249	mg/L	0.0002310	92.81%
Mo 202.031 At	63.4	0.007103	mg/L	0.0003953	0.007103	mg/L	0.0003953	5.57%
Na 589.592 Rt	37251.9	5.25765	mg/L	0.040486	5.25765	mg/L	0.040486	0.77%
Ni 232.003 At	-18.8	-0.000834	mg/L	0.0008536	-0.000834	mg/L	0.0008536	102.39%
P 213.617 At	6.3	0.004248	mg/L	0.0034914	0.004248	mg/L	0.0034914	82.19%
Pb 220.353 At	-3.6	0.000305	mg/L	0.0003325	0.000305	mg/L	0.0003325	108.99%
Sb 206.836 At	4.6	0.002846	mg/L	0.0005784	0.002846	mg/L	0.0005784	20.33%
Sc 361.383 At	-197.4	-0.000167	mg/L	0.0000182	-0.000167	mg/L	0.0000182	10.95%
Se 196.026 At	6.2	0.013401	mg/L	0.0000411	0.013401	mg/L	0.0000411	0.31%
Si 251.611 Rt	13110.9	9.78475	mg/L	0.016606	9.78475	mg/L	0.016606	0.17%
SIO2 251.611 Rt	13110.9	20.9394	mg/L	0.03554	20.9394	mg/L	0.03554	0.17%
Sn 189.927 At	-16.2	-0.005239	mg/L	0.0009846	-0.005239	mg/L	0.0009846	18.79%
Sr 421.552 Rt	174967.8	0.244788	mg/L	0.0003741	0.244788	mg/L	0.0003741	0.15%
Ti 336.121 At	149.3	0.000159	mg/L	0.0000243	0.000159	mg/L	0.0000243	15.27%
Tl 190.801 At	1.2	0.001599	mg/L	0.0000719	0.001599	mg/L	0.0000719	4.49%
U 385.958 At	129.0	0.005691	mg/L	0.0007064	0.005691	mg/L	0.0007064	12.41%
V 292.402 At	83.9	0.001125	mg/L	0.0000366	0.001125	mg/L	0.0000366	3.25%
Zn 206.200 At	-15.7	-0.001857	mg/L	0.0002162	-0.001857	mg/L	0.0002162	11.64%

Sequence No.: 8 ZZZZZZ
Sample ID: ~~W9D0215-01 KG~~ 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 45
Date Collected: 4/27/2009 10:45:01 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

ZZZZZZ

Mean Data: ~~W9D0215-01 KG~~ 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	125351.9	100.198	%	0.6518				0.65%
Lu 261.542 A	2333624.1	98.2241	%	0.31609				0.32%
Ag 328.068 At	-19.7	-0.000145	mg/L	0.0000292	-0.000145	mg/L	0.0000292	20.16%
Al 308.215 Rt	3.7	0.002722	mg/L	0.0014327	0.002722	mg/L	0.0014327	52.64%
As 188.979 At	-0.8	-0.000911	mg/L	0.0002721	-0.000911	mg/L	0.0002721	29.88%
B 249.677 Rt	19.1	0.010229	mg/L	0.0006908	0.010229	mg/L	0.0006908	6.75%
Ba 233.527 At	2370.4	0.059839	mg/L	0.0004967	0.059839	mg/L	0.0004967	0.83%
Be 313.107 Rt	-5.4	-0.000040	mg/L	0.0000064	-0.000040	mg/L	0.0000064	15.91%
Bi 222.821 At	-5.1	0.006889	mg/L	0.0016273	0.006889	mg/L	0.0016273	23.62%
Ca 315.887 Rt	198022.3	57.0699	mg/L	0.05874	57.0699	mg/L	0.05874	0.10%
Cd 226.502 At	0.0	0.000003	mg/L	0.0001089	0.000003	mg/L	0.0001089	>999.9%
Ce 418.660 At	76.1	0.001241	mg/L	0.0000196	0.001241	mg/L	0.0000196	1.58%
Co 228.616 At	-6.2	-0.000382	mg/L	0.0001887	-0.000382	mg/L	0.0001887	49.38%
Cr 267.716 At	41.9	0.000961	mg/L	0.0003854	0.000961	mg/L	0.0003854	40.12%
Cu 324.752 At	-310.2	-0.001854	mg/L	0.0000442	-0.001854	mg/L	0.0000442	2.38%
Fe 273.955 Rt	-3.2	-0.006577	mg/L	0.0021345	-0.006577	mg/L	0.0021345	32.45%
Ga 417.206 At	-0.0	-0.000041	mg/L	0.0001733	-0.000041	mg/L	0.0001733	421.74%
K 766.490 Rt	11922.8	4.80745	mg/L	0.012818	4.80745	mg/L	0.012818	0.27%
La 379.478 At	95.1	0.000355	mg/L	0.0000053	0.000355	mg/L	0.0000053	1.50%
Li 670.784 Rt	389.5	0.003611	mg/L	0.0001053	0.003611	mg/L	0.0001053	2.92%
Mg 279.077 Rt	11126.5	22.5834	mg/L	0.00078	22.5834	mg/L	0.00078	0.00%
Mn 260.568 Rt	6.3	-0.000254	mg/L	0.0001314	-0.000254	mg/L	0.0001314	51.69%
Mo 202.031 At	42.0	0.004484	mg/L	0.0001853	0.004484	mg/L	0.0001853	4.13%
Na 589.592 Rt	131742.7	18.5939	mg/L	0.30555	18.5939	mg/L	0.30555	1.64%
Ni 232.003 At	-22.6	-0.000649	mg/L	0.0004799	-0.000649	mg/L	0.0004799	73.95%
P 213.617 At	76.8	0.050394	mg/L	0.0002634	0.050394	mg/L	0.0002634	0.52%
Pb 220.353 At	2.6	0.002526	mg/L	0.0025075	0.002526	mg/L	0.0025075	99.26%
Sb 206.836 At	4.0	0.002464	mg/L	0.0002650	0.002464	mg/L	0.0002650	10.76%
Sc 361.383 At	-179.2	-0.000158	mg/L	0.0000008	-0.000158	mg/L	0.0000008	0.48%
Se 196.026 At	9.7	0.020103	mg/L	0.0116890	0.020103	mg/L	0.0116890	58.15%
Si 251.611 Rt	20054.0	14.9646	mg/L	0.00169	14.9646	mg/L	0.00169	0.01%
SIO2 251.611 Rt	20054.0	32.0243	mg/L	0.00363	32.0243	mg/L	0.00363	0.01%
Sn 189.927 At	-16.9	-0.005597	mg/L	0.0003325	-0.005597	mg/L	0.0003325	5.94%
Sr 421.552 Rt	495307.5	0.694471	mg/L	0.0030722	0.694471	mg/L	0.0030722	0.44%
Ti 336.121 At	143.7	0.000182	mg/L	0.0000831	0.000182	mg/L	0.0000831	45.74%
Tl 190.801 At	1.9	0.002353	mg/L	0.0002257	0.002353	mg/L	0.0002257	9.59%
U 385.958 At	163.9	0.007900	mg/L	0.0005689	0.007900	mg/L	0.0005689	7.20%
V 292.402 At	401.1	0.005012	mg/L	0.0001370	0.005012	mg/L	0.0001370	2.73%
Zn 206.200 At	-19.4	-0.002445	mg/L	0.0000013	-0.002445	mg/L	0.0000013	0.05%

Sequence No.: 9 ZZZZZZ
Sample ID: ~~W916298-DUP1~~ KG 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 46
Date Collected: 4/27/2009 10:51:10 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

ZZZZZZ

Mean Data: ~~W916298-DUP1~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	126581.2	101.181	%	0.3013				0.30%
Lu 261.542 A	2354384.6	99.0979	%	0.38835				0.39%
Ag 328.068 At	-27.8	-0.000204	mg/L	0.0000287	-0.000204	mg/L	0.0000287	14.02%
Al 308.215 Rt	5.3	0.004019	mg/L	0.0020445	0.004019	mg/L	0.0020445	50.88%
As 188.979 At	-0.4	-0.000476	mg/L	0.0011505	-0.000476	mg/L	0.0011505	241.46%
B 249.677 Rt	20.0	0.010747	mg/L	0.0013075	0.010747	mg/L	0.0013075	12.17%
Ba 233.527 At	2380.0	0.060082	mg/L	0.0000965	0.060082	mg/L	0.0000965	0.16%
Be 313.107 Rt	-1.6	-0.000011	mg/L	0.0000163	-0.000011	mg/L	0.0000163	144.84%
Bi 222.821 At	-7.4	0.004639	mg/L	0.0013246	0.004639	mg/L	0.0013246	28.56%
Ca 315.887 Rt	197188.2	56.8295	mg/L	0.17223	56.8295	mg/L	0.17223	0.30%
Cd 226.502 At	-1.0	-0.000028	mg/L	0.0002443	-0.000028	mg/L	0.0002443	869.19%
Ce 418.660 At	80.5	0.001312	mg/L	0.0000677	0.001312	mg/L	0.0000677	5.16%
Co 228.616 At	-6.6	-0.000408	mg/L	0.0000171	-0.000408	mg/L	0.0000171	4.20%
Cr 267.716 At	38.1	0.000861	mg/L	0.0000922	0.000861	mg/L	0.0000922	10.71%
Cu 324.752 At	-309.1	-0.001848	mg/L	0.0001841	-0.001848	mg/L	0.0001841	9.96%
Fe 273.955 Rt	-0.9	-0.002459	mg/L	0.0033618	-0.002459	mg/L	0.0033618	136.69%
Ga 417.206 At	9.9	0.000074	mg/L	0.0001092	0.000074	mg/L	0.0001092	148.39%
K 766.490 Rt	11871.9	4.78695	mg/L	0.032852	4.78695	mg/L	0.032852	0.69%
La 379.478 At	111.6	0.000432	mg/L	0.0001167	0.000432	mg/L	0.0001167	27.02%
Li 670.784 Rt	381.6	0.003538	mg/L	0.0001077	0.003538	mg/L	0.0001077	3.04%
Mg 279.077 Rt	11046.0	22.4199	mg/L	0.09766	22.4199	mg/L	0.09766	0.44%
Mn 260.568 Rt	6.8	-0.000208	mg/L	0.0000797	-0.000208	mg/L	0.0000797	38.34%
Mo 202.031 At	44.2	0.004776	mg/L	0.0000594	0.004776	mg/L	0.0000594	1.24%
Na 589.592 Rt	130729.5	18.4509	mg/L	0.02439	18.4509	mg/L	0.02439	0.13%
Ni 232.003 At	-23.6	-0.000757	mg/L	0.0009237	-0.000757	mg/L	0.0009237	122.01%
P 213.617 At	75.9	0.049774	mg/L	0.0013022	0.049774	mg/L	0.0013022	2.62%
Pb 220.353 At	2.4	0.002460	mg/L	0.0000225	0.002460	mg/L	0.0000225	0.91%
Sb 206.836 At	4.4	0.002717	mg/L	0.0014794	0.002717	mg/L	0.0014794	54.45%
Sc 361.383 At	-184.8	-0.000163	mg/L	0.0000006	-0.000163	mg/L	0.0000006	0.35%
Se 196.026 At	11.9	0.025059	mg/L	0.0058281	0.025059	mg/L	0.0058281	23.26%
Si 251.611 Rt	19907.3	14.8551	mg/L	0.02931	14.8551	mg/L	0.02931	0.20%
SIO2 251.611 Rt	19907.3	31.7900	mg/L	0.06272	31.7900	mg/L	0.06272	0.20%
Sn 189.927 At	-18.6	-0.006309	mg/L	0.0006416	-0.006309	mg/L	0.0006416	10.17%
Sr 421.552 Rt	495541.6	0.694803	mg/L	0.0028487	0.694803	mg/L	0.0028487	0.41%
Ti 336.121 At	141.7	0.000176	mg/L	0.0000030	0.000176	mg/L	0.0000030	1.68%
Tl 190.801 At	4.0	0.005196	mg/L	0.0042623	0.005196	mg/L	0.0042623	82.04%
U 385.958 At	180.2	0.008836	mg/L	0.0007415	0.008836	mg/L	0.0007415	8.39%
V 292.402 At	400.2	0.005006	mg/L	0.0000998	0.005006	mg/L	0.0000998	1.99%
Zn 206.200 At	-17.1	-0.002176	mg/L	0.0001748	-0.002176	mg/L	0.0001748	8.03%

Sequence No.: 10 ZZZZZZ
Sample ID: ~~W916298-MS1~~ KG 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 47
Date Collected: 4/27/2009 10:57:20 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

ZZZZZZ

Mean Data: ~~W916298-MS1~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	126277.1	100.937	%	0.9958				0.99%
Lu 261.542 A	2313369.0	97.3716	%	0.22689				0.23%
Ag 328.068 At	6775.2	0.050417	mg/L	0.0000050	0.050417	mg/L	0.0000050	0.01%
Al 308.215 Rt	1259.7	1.00575	mg/L	0.015113	1.00575	mg/L	0.015113	1.50%
As 188.979 At	840.3	1.01490	mg/L	0.007739	1.01490	mg/L	0.007739	0.76%
B 249.677 Rt	1846.5	0.990402	mg/L	0.0075343	0.990402	mg/L	0.0075343	0.76%
Ba 233.527 At	40924.7	1.03291	mg/L	0.004936	1.03291	mg/L	0.004936	0.48%
Be 313.107 Rt	123938.5	0.928117	mg/L	0.0020677	0.928117	mg/L	0.0020677	0.22%
Bi 222.821 At	1108.6	0.968540	mg/L	0.0002413	0.968540	mg/L	0.0002413	0.02%
Ca 315.887 Rt	255540.9	73.6433	mg/L	0.20983	73.6433	mg/L	0.20983	0.28%
Cd 226.502 At	31218.7	0.966710	mg/L	0.0031547	0.966710	mg/L	0.0031547	0.33%
Ce 418.660 At	-275.5	-0.001514	mg/L	0.0002558	-0.001514	mg/L	0.0002558	16.89%
Co 228.616 At	15360.8	0.940614	mg/L	0.0062085	0.940614	mg/L	0.0062085	0.66%
Cr 267.716 At	35973.0	0.956288	mg/L	0.0027957	0.956288	mg/L	0.0027957	0.29%
Cu 324.752 At	159326.9	0.949647	mg/L	0.0042165	0.949647	mg/L	0.0042165	0.44%
Fe 273.955 Rt	5288.1	9.33026	mg/L	0.061216	9.33026	mg/L	0.061216	0.66%
Ga 417.206 At	83345.5	0.982022	mg/L	0.0064939	0.982022	mg/L	0.0064939	0.66%
K 766.490 Rt	59018.2	23.7970	mg/L	0.01410	23.7970	mg/L	0.01410	0.06%
La 379.478 At	204470.3	0.955545	mg/L	0.0028319	0.955545	mg/L	0.0028319	0.30%
Li 670.784 Rt	101328.3	0.939485	mg/L	0.0013441	0.939485	mg/L	0.0013441	0.14%
Mg 279.077 Rt	20042.7	40.6809	mg/L	0.31340	40.6809	mg/L	0.31340	0.77%
Mn 260.568 Rt	12266.5	0.947247	mg/L	0.0069427	0.947247	mg/L	0.0069427	0.73%
Mo 202.031 At	7554.6	0.957435	mg/L	0.0071326	0.957435	mg/L	0.0071326	0.74%
Na 589.592 Rt	253754.1	35.8143	mg/L	0.45434	35.8143	mg/L	0.45434	1.27%
Ni 232.003 At	9313.2	0.937987	mg/L	0.0045955	0.937987	mg/L	0.0045955	0.49%
P 213.617 At	1642.5	1.06340	mg/L	0.005561	1.06340	mg/L	0.005561	0.52%
Pb 220.353 At	3456.1	0.988557	mg/L	0.0085519	0.988557	mg/L	0.0085519	0.87%
Sb 206.836 At	1594.8	0.975492	mg/L	0.0067039	0.975492	mg/L	0.0067039	0.69%
Sc 361.383 At	570289.6	0.473304	mg/L	0.0000431	0.473304	mg/L	0.0000431	0.01%
Se 196.026 At	478.1	1.09967	mg/L	0.008727	1.09967	mg/L	0.008727	0.79%
Si 251.611 Rt	25354.6	18.8704	mg/L	0.14422	18.8704	mg/L	0.14422	0.76%
SIO2 251.611 Rt	25354.6	40.3836	mg/L	0.30863	40.3836	mg/L	0.30863	0.76%
Sn 189.927 At	2349.9	0.968901	mg/L	0.0091604	0.968901	mg/L	0.0091604	0.95%
Sr 421.552 Rt	1126917.3	1.58074	mg/L	0.003226	1.58074	mg/L	0.003226	0.20%
Ti 336.121 At	265135.9	0.955190	mg/L	0.0026205	0.955190	mg/L	0.0026205	0.27%
Tl 190.801 At	738.3	0.994814	mg/L	0.0014483	0.994814	mg/L	0.0014483	0.15%
U 385.958 At	1390.8	0.007483	mg/L	0.0013406	0.007483	mg/L	0.0013406	17.91%
V 292.402 At	78912.5	0.980578	mg/L	0.0035891	0.980578	mg/L	0.0035891	0.37%
Zn 206.200 At	8396.2	0.948116	mg/L	0.0081015	0.948116	mg/L	0.0081015	0.85%

Matrix Recovery Check: ~~W916298-MS1~~ KG 4/29/09

ZZZZZZ

Analyte	Expected Conc.	Measured Conc.	Std. Dev.	Units	Recovery (%)
Al 308.215 R	1.00272	1.00575	0.015	mg/L	100.3
B 249.677 R	1.01023	0.990402	0.008	mg/L	98.0
Be 313.107 R	0.999960	0.928117	0.002	mg/L	92.8
Ca 315.887 R	77.0699	73.6433	0.210	mg/L	82.9
Fe 273.955 R	9.99342	9.33026	0.061	mg/L	93.4
K 766.490 R	24.8075	23.7970	0.014	mg/L	94.9
Li 670.784 R	1.00361	0.939485	0.001	mg/L	93.6
Mg 279.077 R	42.5834	40.6809	0.313	mg/L	90.5
Mn 260.568 R	0.999746	0.947247	0.007	mg/L	94.8
Na 589.592 R	37.5939	35.8143	0.454	mg/L	90.6
Si 251.611 R	19.9646	18.8704	0.144	mg/L	78.1
SIO2 251.611 R	42.7243	40.3836	0.309	mg/L	78.1
Sr 421.552 R	1.69447	1.58074	0.003	mg/L	88.6
Ag 328.068 A	0.049855	0.050417	0.000	mg/L	101.1
As 188.979 A	0.999089	1.01490	0.008	mg/L	101.6
Ba 233.527 A	1.05984	1.03291	0.005	mg/L	97.3

Bi 222.821 A	1.00689	0.968540	0.000	mg/L	96.2
Cd 226.502 A	1.00000	0.966710	0.003	mg/L	96.7
Co 228.616 A	0.999618	0.940614	0.006	mg/L	94.1
Cr 267.716 A	1.00096	0.956288	0.003	mg/L	95.5
Cu 324.752 A	0.998146	0.949647	0.004	mg/L	95.2
Ga 417.206 A	0.999959	0.982022	0.006	mg/L	98.2
La 379.478 A	1.00035	0.955545	0.003	mg/L	95.5
Mo 202.031 A	1.00448	0.957435	0.007	mg/L	95.3
Ni 232.003 A	0.999351	0.937987	0.005	mg/L	93.9
P 213.617 A	1.05039	1.06340	0.006	mg/L	101.3
Pb 220.353 A	1.00253	0.988557	0.009	mg/L	98.6
Sb 206.836 A	1.00246	0.975492	0.007	mg/L	97.3
Sc 361.383 A	0.499842	0.473304	0.000	mg/L	94.7
Se 196.026 A	1.02010	1.09967	0.009	mg/L	108.0
Sn 189.927 A	0.994403	0.968901	0.009	mg/L	97.4
Ti 336.121 A	1.00018	0.955190	0.003	mg/L	95.5
Tl 190.801 A	1.00235	0.994814	0.001	mg/L	99.2
U 385.958 A	1.00790	0.007483	0.001	mg/L	-0.0
V 292.402 A	1.00501	0.980578	0.004	mg/L	97.6
Zn 206.200 A	0.997555	0.948116	0.008	mg/L	95.1

Sequence No.: 11
Sample ID: CCV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 6
Date Collected: 4/27/2009 11:03:18 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCV

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	125215.2	100.089	%	0.6184				0.62%
Lu 261.542 A	2336750.2	98.3557	%	0.00165				0.00%
Ag 328.068 At	273184.1	2.01151	mg/L	0.011232	2.01151	mg/L	0.011232	0.56%
QC value within limits for Ag 328.068 A Recovery = 100.58%								
Al 308.215 Rt	2560.8	2.02635	mg/L	0.016193	2.02635	mg/L	0.016193	0.80%
QC value within limits for Al 308.215 R Recovery = 101.32%								
As 188.979 At	1733.4	2.02794	mg/L	0.000937	2.02794	mg/L	0.000937	0.05%
QC value within limits for As 188.979 A Recovery = 101.40%								
B 249.677 Rt	3725.8	1.99830	mg/L	0.013241	1.99830	mg/L	0.013241	0.66%
QC value within limits for B 249.677 R Recovery = 99.91%								
Ba 233.527 At	80714.0	2.03763	mg/L	0.010438	2.03763	mg/L	0.010438	0.51%
QC value within limits for Ba 233.527 A Recovery = 101.88%								
Be 313.107 Rt	262625.2	1.96674	mg/L	0.003832	1.96674	mg/L	0.003832	0.19%
QC value within limits for Be 313.107 R Recovery = 98.34%								
Bi 222.821 At	4205.1	3.78245	mg/L	0.013568	3.78245	mg/L	0.013568	0.36%
QC value within limits for Bi 222.821 A Recovery = 94.56%								
Ca 315.887 Rt	7039.6	2.01770	mg/L	0.021739	2.01770	mg/L	0.021739	1.08%
QC value within limits for Ca 315.887 R Recovery = 100.88%								
Cd 226.502 At	65189.3	2.02248	mg/L	0.009918	2.02248	mg/L	0.009918	0.49%
QC value within limits for Cd 226.502 A Recovery = 101.12%								
Ce 418.660 At	-416.8	-0.002645	mg/L	0.0001870	-0.002645	mg/L	0.0001870	7.07%
QC value within limits for Ce 418.660 A Recovery = Not calculated								
Co 228.616 At	32763.6	2.00649	mg/L	0.012058	2.00649	mg/L	0.012058	0.60%
QC value within limits for Co 228.616 A Recovery = 100.32%								
Cr 267.716 At	75703.9	2.01286	mg/L	0.012307	2.01286	mg/L	0.012307	0.61%
QC value within limits for Cr 267.716 A Recovery = 100.64%								
Cu 324.752 At	336083.0	2.00267	mg/L	0.010980	2.00267	mg/L	0.010980	0.55%
QC value within limits for Cu 324.752 A Recovery = 100.13%								
Fe 273.955 Rt	1134.9	1.98794	mg/L	0.009252	1.98794	mg/L	0.009252	0.47%
QC value within limits for Fe 273.955 R Recovery = 99.40%								
Ga 417.206 At	323747.6	3.83022	mg/L	0.026017	3.83022	mg/L	0.026017	0.68%
QC value within limits for Ga 417.206 A Recovery = 95.76%								
K 766.490 Rt	48986.2	19.7519	mg/L	0.02559	19.7519	mg/L	0.02559	0.13%
QC value within limits for K 766.490 R Recovery = 98.76%								
La 379.478 At	855279.3	4.00700	mg/L	0.010498	4.00700	mg/L	0.010498	0.26%
QC value within limits for La 379.478 A Recovery = 100.17%								
Li 670.784 Rt	416531.2	3.86195	mg/L	0.015673	3.86195	mg/L	0.015673	0.41%
QC value within limits for Li 670.784 R Recovery = 96.55%								
Mg 279.077 Rt	997.8	2.03809	mg/L	0.016016	2.03809	mg/L	0.016016	0.79%
QC value within limits for Mg 279.077 R Recovery = 101.90%								
Mn 260.568 Rt	25227.1	1.95176	mg/L	0.017938	1.95176	mg/L	0.017938	0.92%
QC value within limits for Mn 260.568 R Recovery = 97.59%								
Mo 202.031 At	15908.8	2.01893	mg/L	0.015128	2.01893	mg/L	0.015128	0.75%
QC value within limits for Mo 202.031 A Recovery = 100.95%								
Na 589.592 Rt	140293.3	19.8007	mg/L	0.40902	19.8007	mg/L	0.40902	2.07%
QC value within limits for Na 589.592 R Recovery = 99.00%								
Ni 232.003 At	19977.1	1.99333	mg/L	0.012005	1.99333	mg/L	0.012005	0.60%
QC value within limits for Ni 232.003 A Recovery = 99.67%								
P 213.617 At	14011.3	9.14427	mg/L	0.017587	9.14427	mg/L	0.017587	0.19%
QC value within limits for P 213.617 A Recovery = 91.44%								
Pb 220.353 At	7039.5	2.00907	mg/L	0.008380	2.00907	mg/L	0.008380	0.42%
QC value within limits for Pb 220.353 A Recovery = 100.45%								
Sb 206.836 At	3272.4	2.01045	mg/L	0.004660	2.01045	mg/L	0.004660	0.23%
QC value within limits for Sb 206.836 A Recovery = 100.52%								
Sc 361.383 At	1206342.6	1.00120	mg/L	0.003462	1.00120	mg/L	0.003462	0.35%
QC value within limits for Sc 361.383 A Recovery = 100.12%								
Se 196.026 At	845.7	1.95904	mg/L	0.008070	1.95904	mg/L	0.008070	0.41%
QC value within limits for Se 196.026 A Recovery = 97.95%								
Si 251.611 Rt	13435.0	9.91183	mg/L	0.075646	9.91183	mg/L	0.075646	0.76%
QC value within limits for Si 251.611 R Recovery = 99.12%								

SIO2 251.611 R†	13435.0	21.2128	mg/L	0.16189	21.2128	mg/L	0.16189	0.76%
QC value within limits for SIO2 251.611 R Recovery = 99.13%								
Sn 189.927 A†	9618.0	3.95837	mg/L	0.006189	3.95837	mg/L	0.006189	0.16%
QC value within limits for Sn 189.927 A Recovery = 98.96%								
Sr 421.552 R†	1382453.9	1.94027	mg/L	0.007155	1.94027	mg/L	0.007155	0.37%
QC value within limits for Sr 421.552 R Recovery = 97.01%								
Ti 336.121 A†	558191.8	2.01090	mg/L	0.004909	2.01090	mg/L	0.004909	0.24%
QC value within limits for Ti 336.121 A Recovery = 100.54%								
Tl 190.801 A†	1503.0	2.02490	mg/L	0.009547	2.02490	mg/L	0.009547	0.47%
QC value within limits for Tl 190.801 A Recovery = 101.24%								
U 385.958 A†	19335.1	1.01189	mg/L	0.004942	1.01189	mg/L	0.004942	0.49%
V 292.402 A†	164081.1	2.04167	mg/L	0.014086	2.04167	mg/L	0.014086	0.69%
QC value within limits for V 292.402 A Recovery = 102.08%								
Zn 206.200 A†	17920.4	2.02501	mg/L	0.016341	2.02501	mg/L	0.016341	0.81%
QC value within limits for Zn 206.200 A Recovery = 101.25%								

All analyte(s) passed QC.

Sequence No.: 12
Sample ID: CCB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 1
Date Collected: 4/27/2009 11:09:22 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCB

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	124687.2	99.6666	%	0.26802				0.27%
Lu 261.542 A	2371803.0	99.8311	%	0.13159				0.13%
Ag 328.068 At	10.5	0.000078	mg/L	0.0000114	0.000078	mg/L	0.0000114	14.63%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	-0.5	-0.000421	mg/L	0.0049759	-0.000421	mg/L	0.0049759	>999.9%
QC value within limits for Al 308.215 R Recovery = Not calculated								
As 188.979 At	0.5	0.000556	mg/L	0.0000715	0.000556	mg/L	0.0000715	12.87%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	12.8	0.006854	mg/L	0.0012443	0.006854	mg/L	0.0012443	18.15%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	5.9	0.000148	mg/L	0.0000342	0.000148	mg/L	0.0000342	23.05%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	15.6	0.000117	mg/L	0.0000041	0.000117	mg/L	0.0000041	3.55%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	10.6	0.009905	mg/L	0.0002977	0.009905	mg/L	0.0002977	3.01%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	5.0	0.001444	mg/L	0.0000783	0.001444	mg/L	0.0000783	5.42%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	10.4	0.000322	mg/L	0.0001522	0.000322	mg/L	0.0001522	47.28%
QC value within limits for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	9.0	0.000152	mg/L	0.0000058	0.000152	mg/L	0.0000058	3.82%
Co 228.616 At	4.5	0.000273	mg/L	0.0001931	0.000273	mg/L	0.0001931	70.72%
QC value within limits for Co 228.616 A Recovery = Not calculated								
Cr 267.716 At	5.1	0.000135	mg/L	0.0000058	0.000135	mg/L	0.0000058	4.26%
QC value within limits for Cr 267.716 A Recovery = Not calculated								
Cu 324.752 At	-292.3	-0.001742	mg/L	0.0001868	-0.001742	mg/L	0.0001868	10.72%
QC value within limits for Cu 324.752 A Recovery = Not calculated								
Fe 273.955 Rt	-1.7	-0.003002	mg/L	0.0022693	-0.003002	mg/L	0.0022693	75.59%
QC value within limits for Fe 273.955 R Recovery = Not calculated								
Ga 417.206 At	0.1	-0.000002	mg/L	0.0001925	-0.000002	mg/L	0.0001925	>999.9%
QC value within limits for Ga 417.206 A Recovery = Not calculated								
K 766.490 Rt	-9.2	-0.003708	mg/L	0.0033082	-0.003708	mg/L	0.0033082	89.22%
QC value within limits for K 766.490 R Recovery = Not calculated								
La 379.478 At	48.1	0.000226	mg/L	0.0000194	0.000226	mg/L	0.0000194	8.58%
QC value within limits for La 379.478 A Recovery = Not calculated								
Li 670.784 Rt	-11.9	-0.000110	mg/L	0.0001010	-0.000110	mg/L	0.0001010	91.53%
QC value within limits for Li 670.784 R Recovery = Not calculated								
Mg 279.077 Rt	1.5	0.003139	mg/L	0.0003016	0.003139	mg/L	0.0003016	9.61%
QC value within limits for Mg 279.077 R Recovery = Not calculated								
Mn 260.568 Rt	0.4	0.000033	mg/L	0.0000725	0.000033	mg/L	0.0000725	219.11%
QC value within limits for Mn 260.568 R Recovery = Not calculated								
Mo 202.031 At	10.7	0.001361	mg/L	0.0000366	0.001361	mg/L	0.0000366	2.69%
QC value within limits for Mo 202.031 A Recovery = Not calculated								
Na 589.592 Rt	-423.9	-0.059830	mg/L	0.0008856	-0.059830	mg/L	0.0008856	1.48%
QC value within limits for Na 589.592 R Recovery = Not calculated								
Ni 232.003 At	-1.2	-0.000133	mg/L	0.0003587	-0.000133	mg/L	0.0003587	269.78%
QC value within limits for Ni 232.003 A Recovery = Not calculated								
P 213.617 At	5.0	0.003352	mg/L	0.0025839	0.003352	mg/L	0.0025839	77.09%
QC value within limits for P 213.617 A Recovery = Not calculated								
Pb 220.353 At	-4.3	-0.001231	mg/L	0.0004827	-0.001231	mg/L	0.0004827	39.22%
QC value within limits for Pb 220.353 A Recovery = Not calculated								
Sb 206.836 At	2.3	0.001415	mg/L	0.0023081	0.001415	mg/L	0.0023081	163.06%
QC value within limits for Sb 206.836 A Recovery = Not calculated								
Sc 361.383 At	111.5	0.000093	mg/L	0.0000042	0.000093	mg/L	0.0000042	4.52%
QC value within limits for Sc 361.383 A Recovery = Not calculated								
Se 196.026 At	-0.9	-0.002106	mg/L	0.0008010	-0.002106	mg/L	0.0008010	38.03%
QC value within limits for Se 196.026 A Recovery = Not calculated								
Si 251.611 Rt	35.1	0.026179	mg/L	0.0018100	0.026179	mg/L	0.0018100	6.91%
QC value within limits for Si 251.611 R Recovery = Not calculated								
SIO2 251.611 Rt	35.1	0.056024	mg/L	0.0038733	0.056024	mg/L	0.0038733	6.91%

QC value within limits for SIO2 251.611 R Recovery = Not calculated

Sn 189.927 At	1.3	0.000536	mg/L	0.0017211	0.000536	mg/L	0.0017211 321.17%
QC value within limits for Sn 189.927 A Recovery = Not calculated							
Sr 421.552 Rt	51.2	0.000072	mg/L	0.0000138	0.000072	mg/L	0.0000138 19.23%
QC value within limits for Sr 421.552 R Recovery = Not calculated							
Ti 336.121 At	48.5	0.000174	mg/L	0.0000050	0.000174	mg/L	0.0000050 2.86%
QC value within limits for Ti 336.121 A Recovery = Not calculated							
Tl 190.801 At	0.5	0.000714	mg/L	0.0008224	0.000714	mg/L	0.0008224 115.23%
QC value within limits for Tl 190.801 A Recovery = Not calculated							
U 385.958 At	-0.2	-0.000014	mg/L	0.0002871	-0.000014	mg/L	0.0002871 >999.9%
V 292.402 At	5.0	0.000075	mg/L	0.0003831	0.000075	mg/L	0.0003831 513.02%
QC value within limits for V 292.402 A Recovery = Not calculated							
Zn 206.200 At	-1.5	-0.000171	mg/L	0.0002075	-0.000171	mg/L	0.0002075 121.10%
QC value within limits for Zn 206.200 A Recovery = Not calculated							

All analyte(s) passed QC.

112

Sequence No.: 13 ZZZZZZ
Sample ID: ~~W9D0215-02~~ KG 4/29/09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 48
Date Collected: 4/27/2009 11:15:08 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

ZZZZZZ

Mean Data: ~~W9D0215-02~~ KG 4/29/09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	123779.7	98.9412	%	0.60730				0.61%
Lu 261.542 A	2273202.9	95.6809	%	0.04707				0.05%
Ag 328.068 At	-39.1	-0.000297	mg/L	0.0000225	-0.000297	mg/L	0.0000225	7.60%
Al 308.215 Rt	11.3	0.008585	mg/L	0.0034188	0.008585	mg/L	0.0034188	39.82%
As 188.979 At	5.4	0.006878	mg/L	0.0027906	0.006878	mg/L	0.0027906	40.58%
B 249.677 Rt	417.0	0.223594	mg/L	0.0001005	0.223594	mg/L	0.0001005	0.04%
Ba 233.527 At	5002.0	0.126273	mg/L	0.0013913	0.126273	mg/L	0.0013913	1.10%
Be 313.107 Rt	-8.0	-0.000058	mg/L	0.0000137	-0.000058	mg/L	0.0000137	23.77%
Bi 222.821 At	-7.9	0.002153	mg/L	0.0012077	0.002153	mg/L	0.0012077	56.10%
Ca 315.887 Rt	429731.4	123.835	mg/L	0.0457	123.835	mg/L	0.0457	0.04%
Cd 226.502 At	2.4	0.000084	mg/L	0.0002474	0.000084	mg/L	0.0002474	294.72%
Ce 418.660 At	135.9	0.002171	mg/L	0.0006302	0.002171	mg/L	0.0006302	29.03%
Co 228.616 At	-4.4	-0.000281	mg/L	0.0000746	-0.000281	mg/L	0.0000746	26.59%
Cr 267.716 At	49.9	0.000918	mg/L	0.0000642	0.000918	mg/L	0.0000642	7.00%
Cu 324.752 At	83.5	0.000475	mg/L	0.0001601	0.000475	mg/L	0.0001601	33.71%
Fe 273.955 Rt	-0.4	-0.003203	mg/L	0.0001380	-0.003203	mg/L	0.0001380	4.31%
Ga 417.206 At	5.4	-0.000029	mg/L	0.0000296	-0.000029	mg/L	0.0000296	101.70%
K 766.490 Rt	18661.7	7.52467	mg/L	0.041090	7.52467	mg/L	0.041090	0.55%
La 379.478 At	134.8	0.000456	mg/L	0.0000844	0.000456	mg/L	0.0000844	18.51%
Li 670.784 Rt	2171.3	0.020132	mg/L	0.0001552	0.020132	mg/L	0.0001552	0.77%
Mg 279.077 Rt	29949.1	60.7880	mg/L	0.18889	60.7880	mg/L	0.18889	0.31%
Mn 260.568 Rt	5.0	-0.001608	mg/L	0.0000090	-0.001608	mg/L	0.0000090	0.56%
Mo 202.031 At	69.8	0.007042	mg/L	0.0000359	0.007042	mg/L	0.0000359	0.51%
Na 589.592 Rt	871892.2	123.057	mg/L	0.4423	123.057	mg/L	0.4423	0.36%
Ni 232.003 At	-15.5	-0.000269	mg/L	0.0002113	-0.000269	mg/L	0.0002113	78.57%
P 213.617 At	88.4	0.058008	mg/L	0.0032141	0.058008	mg/L	0.0032141	5.54%
Pb 220.353 At	-4.0	0.001009	mg/L	0.0012723	0.001009	mg/L	0.0012723	126.13%
Sb 206.836 At	7.0	0.004299	mg/L	0.0010925	0.004299	mg/L	0.0010925	25.42%
Sc 361.383 At	-324.0	-0.000306	mg/L	0.0000123	-0.000306	mg/L	0.0000123	4.01%
Se 196.026 At	17.1	0.033215	mg/L	0.0023317	0.033215	mg/L	0.0023317	7.02%
Si 251.611 Rt	16391.1	12.2234	mg/L	0.03379	12.2234	mg/L	0.03379	0.28%
SIO2 251.611 Rt	16391.1	26.1584	mg/L	0.07230	26.1584	mg/L	0.07230	0.28%
Sn 189.927 At	-35.2	-0.011479	mg/L	0.0027274	-0.011479	mg/L	0.0027274	23.76%
Sr 421.552 Rt	1890230.5	2.65145	mg/L	0.004048	2.65145	mg/L	0.004048	0.15%
Ti 336.121 At	269.6	0.000211	mg/L	0.0000131	0.000211	mg/L	0.0000131	6.21%
Tl 190.801 At	4.2	0.005284	mg/L	0.0009452	0.005284	mg/L	0.0009452	17.89%
U 385.958 At	625.4	0.032649	mg/L	0.0009856	0.032649	mg/L	0.0009856	3.02%
V 292.402 At	333.9	0.004283	mg/L	0.0000293	0.004283	mg/L	0.0000293	0.68%
Zn 206.200 At	-15.2	-0.002223	mg/L	0.0001566	-0.002223	mg/L	0.0001566	7.04%

Sequence No.: 14
Sample ID: CCV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 6
Date Collected: 4/27/2009 11:21:21 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCV

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	125534.2	100.344	%	0.2744				0.27%
Lu 261.542 A	2337657.4	98.3939	%	0.05479				0.06%
Ag 328.068 At	272465.1	2.00621	mg/L	0.003373	2.00621	mg/L	0.003373	0.17%
QC value within limits for Ag 328.068 A Recovery = 100.31%								
Al 308.215 Rt	2561.8	2.02756	mg/L	0.001101	2.02756	mg/L	0.001101	0.05%
QC value within limits for Al 308.215 R Recovery = 101.38%								
As 188.979 At	1726.4	2.01963	mg/L	0.000523	2.01963	mg/L	0.000523	0.03%
QC value within limits for As 188.979 A Recovery = 100.98%								
B 249.677 Rt	3725.1	1.99791	mg/L	0.001468	1.99791	mg/L	0.001468	0.07%
QC value within limits for B 249.677 R Recovery = 99.90%								
Ba 233.527 At	80447.2	2.03090	mg/L	0.007497	2.03090	mg/L	0.007497	0.37%
QC value within limits for Ba 233.527 A Recovery = 101.54%								
Be 313.107 Rt	261895.4	1.96127	mg/L	0.003166	1.96127	mg/L	0.003166	0.16%
QC value within limits for Be 313.107 R Recovery = 98.06%								
Bi 222.821 At	4240.4	3.81577	mg/L	0.003533	3.81577	mg/L	0.003533	0.09%
QC value within limits for Bi 222.821 A Recovery = 95.39%								
Ca 315.887 Rt	7010.8	2.00938	mg/L	0.010049	2.00938	mg/L	0.010049	0.50%
QC value within limits for Ca 315.887 R Recovery = 100.47%								
Cd 226.502 At	64879.0	2.01285	mg/L	0.004682	2.01285	mg/L	0.004682	0.23%
QC value within limits for Cd 226.502 A Recovery = 100.64%								
Ce 418.660 At	-423.2	-0.002773	mg/L	0.0003984	-0.002773	mg/L	0.0003984	14.36%
QC value within limits for Ce 418.660 A Recovery = Not calculated								
Co 228.616 At	32671.9	2.00087	mg/L	0.004901	2.00087	mg/L	0.004901	0.24%
QC value within limits for Co 228.616 A Recovery = 100.04%								
Cr 267.716 At	75391.3	2.00455	mg/L	0.004739	2.00455	mg/L	0.004739	0.24%
QC value within limits for Cr 267.716 A Recovery = 100.23%								
Cu 324.752 At	334207.4	1.99149	mg/L	0.005422	1.99149	mg/L	0.005422	0.27%
QC value within limits for Cu 324.752 A Recovery = 99.57%								
Fe 273.955 Rt	1128.3	1.97643	mg/L	0.008075	1.97643	mg/L	0.008075	0.41%
QC value within limits for Fe 273.955 R Recovery = 98.82%								
Ga 417.206 At	323784.2	3.83068	mg/L	0.000873	3.83068	mg/L	0.000873	0.02%
QC value within limits for Ga 417.206 A Recovery = 95.77%								
K 766.490 Rt	48886.4	19.7117	mg/L	0.04005	19.7117	mg/L	0.04005	0.20%
QC value within limits for K 766.490 R Recovery = 98.56%								
La 379.478 At	853060.5	3.99662	mg/L	0.008721	3.99662	mg/L	0.008721	0.22%
QC value within limits for La 379.478 A Recovery = 99.92%								
Li 670.784 Rt	416734.6	3.86383	mg/L	0.001320	3.86383	mg/L	0.001320	0.03%
QC value within limits for Li 670.784 R Recovery = 96.60%								
Mg 279.077 Rt	994.2	2.03092	mg/L	0.010320	2.03092	mg/L	0.010320	0.51%
QC value within limits for Mg 279.077 R Recovery = 101.55%								
Mn 260.568 Rt	25148.4	1.94568	mg/L	0.003610	1.94568	mg/L	0.003610	0.19%
QC value within limits for Mn 260.568 R Recovery = 97.28%								
Mo 202.031 At	15838.0	2.00995	mg/L	0.007959	2.00995	mg/L	0.007959	0.40%
QC value within limits for Mo 202.031 A Recovery = 100.50%								
Na 589.592 Rt	141366.0	19.9521	mg/L	0.08940	19.9521	mg/L	0.08940	0.45%
QC value within limits for Na 589.592 R Recovery = 99.76%								
Ni 232.003 At	19902.2	1.98589	mg/L	0.003002	1.98589	mg/L	0.003002	0.15%
QC value within limits for Ni 232.003 A Recovery = 99.29%								
P 213.617 At	14006.4	9.14134	mg/L	0.008501	9.14134	mg/L	0.008501	0.09%
QC value within limits for P 213.617 A Recovery = 91.41%								
Pb 220.353 At	7049.2	2.01181	mg/L	0.000629	2.01181	mg/L	0.000629	0.03%
QC value within limits for Pb 220.353 A Recovery = 100.59%								
Sb 206.836 At	3271.7	2.01001	mg/L	0.003025	2.01001	mg/L	0.003025	0.15%
QC value within limits for Sb 206.836 A Recovery = 100.50%								
Sc 361.383 At	1203563.7	0.998888	mg/L	0.0030625	0.998888	mg/L	0.0030625	0.31%
QC value within limits for Sc 361.383 A Recovery = 99.89%								
Se 196.026 At	844.0	1.95521	mg/L	0.008761	1.95521	mg/L	0.008761	0.45%
QC value within limits for Se 196.026 A Recovery = 97.76%								
Si 251.611 Rt	13357.5	9.85431	mg/L	0.026630	9.85431	mg/L	0.026630	0.27%
QC value within limits for Si 251.611 R Recovery = 98.54%								

SIO2 251.611 R†	13357.5	21.0897	mg/L	0.05698	21.0897	mg/L	0.05698	0.27%
QC value within limits for SIO2 251.611 R Recovery = 98.55%								
Sn 189.927 A†	9596.4	3.94946	mg/L	0.003381	3.94946	mg/L	0.003381	0.09%
QC value within limits for Sn 189.927 A Recovery = 98.74%								
Sr 421.552 R†	1378177.0	1.93427	mg/L	0.000444	1.93427	mg/L	0.000444	0.02%
QC value within limits for Sr 421.552 R Recovery = 96.71%								
Ti 336.121 A†	557505.9	2.00866	mg/L	0.005169	2.00866	mg/L	0.005169	0.26%
QC value within limits for Ti 336.121 A Recovery = 100.43%								
Tl 190.801 A†	1499.6	2.02024	mg/L	0.003205	2.02024	mg/L	0.003205	0.16%
QC value within limits for Tl 190.801 A Recovery = 101.01%								
U 385.958 A†	19316.1	1.01104	mg/L	0.000483	1.01104	mg/L	0.000483	0.05%
V 292.402 A†	163328.2	2.03231	mg/L	0.003330	2.03231	mg/L	0.003330	0.16%
QC value within limits for V 292.402 A Recovery = 101.62%								
Zn 206.200 A†	17827.0	2.01446	mg/L	0.014475	2.01446	mg/L	0.014475	0.72%
QC value within limits for Zn 206.200 A Recovery = 100.72%								

All analyte(s) passed QC.

Sequence No.: 15
Sample ID: CCB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 1
Date Collected: 4/27/2009 11:27:20 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCB

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	124695.6	99.6733	%	0.04682				0.05%
Lu 261.542 A	2353236.3	99.0496	%	0.48735				0.49%
Ag 328.068 At	-8.6	-0.000063	mg/L	0.0001849	-0.000063	mg/L	0.0001849	291.43%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	-1.8	-0.001480	mg/L	0.0043612	-0.001480	mg/L	0.0043612	294.58%
QC value within limits for Al 308.215 R Recovery = Not calculated								
As 188.979 At	-0.5	-0.000603	mg/L	0.0019066	-0.000603	mg/L	0.0019066	316.26%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	12.7	0.006813	mg/L	0.0005081	0.006813	mg/L	0.0005081	7.46%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	0.6	0.000016	mg/L	0.0000047	0.000016	mg/L	0.0000047	30.18%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	6.3	0.000047	mg/L	0.0000312	0.000047	mg/L	0.0000312	66.33%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	10.9	0.010232	mg/L	0.0003776	0.010232	mg/L	0.0003776	3.69%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	1.9	0.000554	mg/L	0.0009454	0.000554	mg/L	0.0009454	170.75%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	9.3	0.000287	mg/L	0.0000711	0.000287	mg/L	0.0000711	24.75%
QC value within limits for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	-5.3	-0.000082	mg/L	0.0001214	-0.000082	mg/L	0.0001214	147.21%
Co 228.616 At	1.1	0.000070	mg/L	0.0001449	0.000070	mg/L	0.0001449	208.14%
QC value within limits for Co 228.616 A Recovery = Not calculated								
Cr 267.716 At	-1.8	-0.000047	mg/L	0.0000037	-0.000047	mg/L	0.0000037	7.81%
QC value within limits for Cr 267.716 A Recovery = Not calculated								
Cu 324.752 At	-341.2	-0.002033	mg/L	0.0001014	-0.002033	mg/L	0.0001014	4.99%
QC value within limits for Cu 324.752 A Recovery = Not calculated								
Fe 273.955 Rt	-2.3	-0.004018	mg/L	0.0044070	-0.004018	mg/L	0.0044070	109.67%
QC value within limits for Fe 273.955 R Recovery = Not calculated								
Ga 417.206 At	21.6	0.000259	mg/L	0.0000449	0.000259	mg/L	0.0000449	17.38%
QC value within limits for Ga 417.206 A Recovery = Not calculated								
K 766.490 Rt	-5.0	-0.002004	mg/L	0.0104585	-0.002004	mg/L	0.0104585	521.77%
QC value within limits for K 766.490 R Recovery = Not calculated								
La 379.478 At	26.1	0.000124	mg/L	0.0000651	0.000124	mg/L	0.0000651	52.58%
QC value within limits for La 379.478 A Recovery = Not calculated								
Li 670.784 Rt	-28.9	-0.000268	mg/L	0.0001197	-0.000268	mg/L	0.0001197	44.72%
QC value within limits for Li 670.784 R Recovery = Not calculated								
Mg 279.077 Rt	2.8	0.005611	mg/L	0.0067513	0.005611	mg/L	0.0067513	120.32%
QC value within limits for Mg 279.077 R Recovery = Not calculated								
Mn 260.568 Rt	-2.4	-0.000184	mg/L	0.0001276	-0.000184	mg/L	0.0001276	69.37%
QC value within limits for Mn 260.568 R Recovery = Not calculated								
Mo 202.031 At	9.4	0.001192	mg/L	0.0001310	0.001192	mg/L	0.0001310	10.99%
QC value within limits for Mo 202.031 A Recovery = Not calculated								
Na 589.592 Rt	-433.0	-0.061116	mg/L	0.0009906	-0.061116	mg/L	0.0009906	1.62%
QC value within limits for Na 589.592 R Recovery = Not calculated								
Ni 232.003 At	-3.1	-0.000321	mg/L	0.0003685	-0.000321	mg/L	0.0003685	114.61%
QC value within limits for Ni 232.003 A Recovery = Not calculated								
P 213.617 At	1.5	0.001047	mg/L	0.0006058	0.001047	mg/L	0.0006058	57.86%
QC value within limits for P 213.617 A Recovery = Not calculated								
Pb 220.353 At	1.8	0.000520	mg/L	0.0001895	0.000520	mg/L	0.0001895	36.42%
QC value within limits for Pb 220.353 A Recovery = Not calculated								
Sb 206.836 At	0.2	0.000122	mg/L	0.0002556	0.000122	mg/L	0.0002556	208.97%
QC value within limits for Sb 206.836 A Recovery = Not calculated								
Sc 361.383 At	65.9	0.000055	mg/L	0.0000061	0.000055	mg/L	0.0000061	11.10%
QC value within limits for Sc 361.383 A Recovery = Not calculated								
Se 196.026 At	-1.3	-0.003000	mg/L	0.0042430	-0.003000	mg/L	0.0042430	141.45%
QC value within limits for Se 196.026 A Recovery = Not calculated								
Si 251.611 Rt	32.1	0.023947	mg/L	0.0001632	0.023947	mg/L	0.0001632	0.68%
QC value within limits for Si 251.611 R Recovery = Not calculated								
SIO2 251.611 Rt	32.1	0.051247	mg/L	0.0003491	0.051247	mg/L	0.0003491	0.68%

QC value within limits for SIO2 251.611 R Recovery = Not calculated						
Sn 189.927 At	1.3	0.000517 mg/L	0.0004266	0.000517 mg/L	0.0004266	82.56%
QC value within limits for Sn 189.927 A Recovery = Not calculated						
Sr 421.552 Rt	-5.1	-0.000007 mg/L	0.0000261	-0.000007 mg/L	0.0000261	362.35%
QC value within limits for Sr 421.552 R Recovery = Not calculated						
Ti 336.121 At	41.2	0.000152 mg/L	0.0000541	0.000152 mg/L	0.0000541	35.47%
QC value within limits for Ti 336.121 A Recovery = Not calculated						
Tl 190.801 At	1.2	0.001578 mg/L	0.0012521	0.001578 mg/L	0.0012521	79.35%
QC value within limits for Tl 190.801 A Recovery = Not calculated						
U 385.958 At	-4.7	-0.000268 mg/L	0.0005052	-0.000268 mg/L	0.0005052	188.65%
V 292.402 At	-12.3	-0.000141 mg/L	0.0000850	-0.000141 mg/L	0.0000850	60.42%
QC value within limits for V 292.402 A Recovery = Not calculated						
Zn 206.200 At	-1.3	-0.000149 mg/L	0.0001528	-0.000149 mg/L	0.0001528	102.22%
QC value within limits for Zn 206.200 A Recovery = Not calculated						
All analyte(s) passed QC.						

==========

Analysis Begun

Start Time: 4/27/2009 11:43:08 AM
Logged In Analyst: Optima5
Spectrometer Model: Optima 5300 DV, S/N 077N5011902
Plasma On Time: 4/27/2009 6:27:37 AM
Technique: ICP Continuous
Autosampler Model: AS-93plus

Sample Information File: C:\pe\Administrator\Sample Information\START.sif
Batch ID: W917039
Results Data Set: 09117A
Results Library: C:\pe\Administrator\Results\Results.mdb

==========

Method Loaded
Method Name: OPT5
IEC File: OPTIMA5.iec
Method Description:
Method Last Saved: 4/27/2009 10:08:13 AM
MSF File:

==========

Sequence No.: 1
Sample ID: W917039-BLK1
Analyst:
Initial Sample Wt:
Dilution:
User canceled analysis.
Autosampler Location: 38
Date Collected: 4/27/2009 11:43:10 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

==========

Analysis Begun

Start Time: 4/27/2009 11:46:10 AM
Logged In Analyst: Optima5
Spectrometer Model: Optima 5300 DV, S/N 077N5011902
Plasma On Time: 4/27/2009 6:27:37 AM
Technique: ICP Continuous
Autosampler Model: AS-93plus

Sample Information File: C:\pe\Administrator\Sample Information\START.sif
Batch ID: W917039
Results Data Set: 09117A
Results Library: C:\pe\Administrator\Results\Results.mdb

==========

Sequence No.: 1
Sample ID: W917039-BLK1
Analyst:
Initial Sample Wt:
Dilution:
Autosampler Location: 38
Date Collected: 4/27/2009 11:46:10 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W917039-BLK1

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	122919.5	98.2536	%	1.39417				1.42%
Lu 261.542 A	2318905.4	97.6046	%	0.07263				0.07%
Ag 328.068 At	-4.5	-0.000034	mg/L	0.0000444	-0.000034	mg/L	0.0000444	131.67%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	4.5	0.003692	mg/L	0.0026102	0.003692	mg/L	0.0026102	70.69%
QC value within limits for Al 308.215 R Recovery = Not calculated								
As 188.979 At	-2.1	-0.002620	mg/L	0.0028188	-0.002620	mg/L	0.0028188	107.58%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	6.3	0.003407	mg/L	0.0002635	0.003407	mg/L	0.0002635	7.73%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	-6.7	-0.000168	mg/L	0.0000807	-0.000168	mg/L	0.0000807	47.91%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	-0.1	-0.000001	mg/L	0.0000175	-0.000001	mg/L	0.0000175	>999.9%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	7.6	0.007112	mg/L	0.0027604	0.007112	mg/L	0.0027604	38.81%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	54.4	0.015689	mg/L	0.0008506	0.015689	mg/L	0.0008506	5.42%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	-2.1	-0.000068	mg/L	0.0000953	-0.000068	mg/L	0.0000953	140.18%
QC value within limits for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	-11.6	-0.000187	mg/L	0.0002096	-0.000187	mg/L	0.0002096	112.12%
Co 228.616 At	-8.1	-0.000495	mg/L	0.0001476	-0.000495	mg/L	0.0001476	29.82%

QC value within limits for Co 228.616 A Recovery = Not calculated						
Cr 267.716 At	30.2	0.000802 mg/L	0.0002891	0.000802 mg/L	0.0002891	36.04%
QC value within limits for Cr 267.716 A Recovery = Not calculated						
Cu 324.752 At	-277.2	-0.001652 mg/L	0.0001047	-0.001652 mg/L	0.0001047	6.34%
QC value within limits for Cu 324.752 A Recovery = Not calculated						
Fe 273.955 Rt	2.6	0.004522 mg/L	0.0029983	0.004522 mg/L	0.0029983	66.31%
QC value within limits for Fe 273.955 R Recovery = Not calculated						
Ga 417.206 At	3.2	0.000043 mg/L	0.0001158	0.000043 mg/L	0.0001158	270.86%
QC value within limits for Ga 417.206 A Recovery = Not calculated						
K 766.490 Rt	-19.2	-0.007727 mg/L	0.0072539	-0.007727 mg/L	0.0072539	93.87%
QC value within limits for K 766.490 R Recovery = Not calculated						
La 379.478 At	-0.0	0.000000 mg/L	0.0000280	0.000000 mg/L	0.0000280	>999.9%
QC value within limits for La 379.478 A Recovery = Not calculated						
Li 670.784 Rt	-111.1	-0.001030 mg/L	0.0000635	-0.001030 mg/L	0.0000635	6.17%
QC value within limits for Li 670.784 R Recovery = Not calculated						
Mg 279.077 Rt	-1.2	-0.002359 mg/L	0.0008928	-0.002359 mg/L	0.0008928	37.84%
QC value within limits for Mg 279.077 R Recovery = Not calculated						
Mn 260.568 Rt	2.8	0.000218 mg/L	0.0002543	0.000218 mg/L	0.0002543	116.37%
QC value within limits for Mn 260.568 R Recovery = Not calculated						
Mo 202.031 At	9.0	0.001138 mg/L	0.0001008	0.001138 mg/L	0.0001008	8.86%
QC value within limits for Mo 202.031 A Recovery = Not calculated						
Na 589.592 Rt	-422.9	-0.059690 mg/L	0.0017008	-0.059690 mg/L	0.0017008	2.85%
QC value within limits for Na 589.592 R Recovery = Not calculated						
Ni 232.003 At	-17.8	-0.001855 mg/L	0.0003216	-0.001855 mg/L	0.0003216	17.33%
QC value within limits for Ni 232.003 A Recovery = Not calculated						
P 213.617 At	-5.5	-0.003509 mg/L	0.0023827	-0.003509 mg/L	0.0023827	67.91%
QC value within limits for P 213.617 A Recovery = Not calculated						
Pb 220.353 At	1.5	0.000443 mg/L	0.0005055	0.000443 mg/L	0.0005055	114.09%
QC value within limits for Pb 220.353 A Recovery = Not calculated						
Sb 206.836 At	-0.1	-0.000061 mg/L	0.0001768	-0.000061 mg/L	0.0001768	290.42%
QC value within limits for Sb 206.836 A Recovery = Not calculated						
Sc 361.383 At	4.6	0.000004 mg/L	0.0000021	0.000004 mg/L	0.0000021	51.00%
QC value within limits for Sc 361.383 A Recovery = Not calculated						
Se 196.026 At	-4.5	-0.010274 mg/L	0.0004790	-0.010274 mg/L	0.0004790	4.66%
QC value within limits for Se 196.026 A Recovery = Not calculated						
Si 251.611 Rt	36.0	0.026865 mg/L	0.0012464	0.026865 mg/L	0.0012464	4.64%
QC value within limits for Si 251.611 R Recovery = Not calculated						
SIO2 251.611 Rt	36.0	0.057493 mg/L	0.0026673	0.057493 mg/L	0.0026673	4.64%
QC value within limits for SIO2 251.611 R Recovery = Not calculated						
Sn 189.927 At	-2.7	-0.001116 mg/L	0.0009793	-0.001116 mg/L	0.0009793	87.72%
QC value within limits for Sn 189.927 A Recovery = Not calculated						
Sr 421.552 Rt	-6.3	-0.000009 mg/L	0.0000230	-0.000009 mg/L	0.0000230	253.03%
QC value within limits for Sr 421.552 R Recovery = Not calculated						
Ti 336.121 At	-68.8	-0.000275 mg/L	0.0000367	-0.000275 mg/L	0.0000367	13.36%
QC value within limits for Ti 336.121 A Recovery = Not calculated						
Tl 190.801 At	-1.4	-0.001900 mg/L	0.0027439	-0.001900 mg/L	0.0027439	144.42%
QC value within limits for Tl 190.801 A Recovery = Not calculated						
U 385.958 At	-0.1	-0.000020 mg/L	0.0003145	-0.000020 mg/L	0.0003145	>999.9%
V 292.402 At	-6.6	-0.000070 mg/L	0.0000505	-0.000070 mg/L	0.0000505	72.59%
QC value within limits for V 292.402 A Recovery = Not calculated						
Zn 206.200 At	11.7	0.001327 mg/L	0.0002333	0.001327 mg/L	0.0002333	17.58%
QC value within limits for Zn 206.200 A Recovery = Not calculated						
All analyte(s) passed QC.						

Sequence No.: 2
Sample ID: W917039-BS1
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 39
Date Collected: 4/27/2009 11:51:57 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W917039-BS1

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	122997.7	98.3161	%	0.36154				0.37%
Lu 261.542 A	2275849.3	95.7923	%	0.19433				0.20%
Ag 328.068 At	6789.8	0.050548	mg/L	0.0000100	0.050548	mg/L	0.0000100	0.02%
QC value within limits for Ag 328.068 A Recovery = 101.10%								
Al 308.215 Rt	1286.3	1.02647	mg/L	0.001159	1.02647	mg/L	0.001159	0.11%
QC value within limits for Al 308.215 R Recovery = 102.65%								
As 188.979 At	792.6	0.953676	mg/L	0.0078736	0.953676	mg/L	0.0078736	0.83%
QC value within limits for As 188.979 A Recovery = 95.37%								
B 249.677 Rt	1853.8	0.994355	mg/L	0.0018345	0.994355	mg/L	0.0018345	0.18%
QC value within limits for B 249.677 R Recovery = 99.44%								
Ba 233.527 At	39868.1	1.00624	mg/L	0.003739	1.00624	mg/L	0.003739	0.37%
QC value within limits for Ba 233.527 A Recovery = 100.62%								
Be 313.107 Rt	130647.0	0.978351	mg/L	0.0022939	0.978351	mg/L	0.0022939	0.23%
QC value within limits for Be 313.107 R Recovery = 97.84%								
Bi 222.821 At	1122.6	0.967721	mg/L	0.0108314	0.967721	mg/L	0.0108314	1.12%
QC value within limits for Bi 222.821 A Recovery = 96.77%								
Ca 315.887 Rt	69279.3	19.9627	mg/L	0.08513	19.9627	mg/L	0.08513	0.43%
QC value within limits for Ca 315.887 R Recovery = 99.81%								
Cd 226.502 At	31161.1	0.964875	mg/L	0.0027626	0.964875	mg/L	0.0027626	0.29%
QC value within limits for Cd 226.502 A Recovery = 96.49%								
Ce 418.660 At	-212.1	-0.000282	mg/L	0.0000091	-0.000282	mg/L	0.0000091	3.23%
Co 228.616 At	15948.1	0.976537	mg/L	0.0032155	0.976537	mg/L	0.0032155	0.33%
QC value within limits for Co 228.616 A Recovery = 97.65%								
Cr 267.716 At	37247.4	0.990322	mg/L	0.0038432	0.990322	mg/L	0.0038432	0.39%
QC value within limits for Cr 267.716 A Recovery = 99.03%								
Cu 324.752 At	172282.1	1.02687	mg/L	0.002078	1.02687	mg/L	0.002078	0.20%
QC value within limits for Cu 324.752 A Recovery = 102.69%								
Fe 273.955 Rt	5415.4	9.55582	mg/L	0.075950	9.55582	mg/L	0.075950	0.79%
QC value within limits for Fe 273.955 R Recovery = 95.56%								
Ga 417.206 At	82133.8	0.967207	mg/L	0.0062399	0.967207	mg/L	0.0062399	0.65%
QC value within limits for Ga 417.206 A Recovery = 96.72%								
K 766.490 Rt	49598.4	19.9988	mg/L	0.02314	19.9988	mg/L	0.02314	0.12%
QC value within limits for K 766.490 R Recovery = 99.99%								
La 379.478 At	216668.6	1.01273	mg/L	0.000016	1.01273	mg/L	0.000016	0.00%
QC value within limits for La 379.478 A Recovery = 101.27%								
Li 670.784 Rt	107891.1	1.00033	mg/L	0.001608	1.00033	mg/L	0.001608	0.16%
QC value within limits for Li 670.784 R Recovery = 100.03%								
Mg 279.077 Rt	9949.2	20.1943	mg/L	0.05087	20.1943	mg/L	0.05087	0.25%
QC value within limits for Mg 279.077 R Recovery = 100.97%								
Mn 260.568 Rt	12686.4	0.980397	mg/L	0.0051229	0.980397	mg/L	0.0051229	0.52%
QC value within limits for Mn 260.568 R Recovery = 98.04%								
Mo 202.031 At	7928.9	1.00571	mg/L	0.003305	1.00571	mg/L	0.003305	0.33%
QC value within limits for Mo 202.031 A Recovery = 100.57%								
Na 589.592 Rt	138181.9	19.5027	mg/L	0.13211	19.5027	mg/L	0.13211	0.68%
QC value within limits for Na 589.592 R Recovery = 102.65%								
Ni 232.003 At	9349.2	0.939160	mg/L	0.0006824	0.939160	mg/L	0.0006824	0.07%
QC value within limits for Ni 232.003 A Recovery = 93.92%								
P 213.617 At	1414.9	0.912718	mg/L	0.0091768	0.912718	mg/L	0.0091768	1.01%
QC value within limits for P 213.617 A Recovery = 91.27%								
Pb 220.353 At	3431.8	0.979974	mg/L	0.0009553	0.979974	mg/L	0.0009553	0.10%
QC value within limits for Pb 220.353 A Recovery = 98.00%								
Sb 206.836 At	1578.7	0.965740	mg/L	0.0004204	0.965740	mg/L	0.0004204	0.04%
QC value within limits for Sb 206.836 A Recovery = 96.57%								
Sc 361.383 At	592778.2	0.491978	mg/L	0.0001832	0.491978	mg/L	0.0001832	0.04%
QC value within limits for Sc 361.383 A Recovery = 98.40%								
Se 196.026 At	381.1	0.878510	mg/L	0.0023888	0.878510	mg/L	0.0023888	0.27%
QC value within limits for Se 196.026 A Recovery = 87.85%								
Si 251.611 Rt	6537.4	4.82647	mg/L	0.029297	4.82647	mg/L	0.029297	0.61%
QC value within limits for Si 251.611 R Recovery = 96.53%								
SIO2 251.611 Rt	6537.4	10.3294	mg/L	0.06269	10.3294	mg/L	0.06269	0.61%

QC value within limits for SIO2 251.611 R Recovery = 96.54%

Sn 189.927 At	2383.8	0.981597 mg/L	0.0012714	0.981597 mg/L	0.0012714	0.13%

QC value within limits for Sn 189.927 A Recovery = 98.16%

Sr 421.552 Rt	699304.8	0.981241 mg/L	0.0023606	0.981241 mg/L	0.0023606	0.24%

QC value within limits for Sr 421.552 R Recovery = 98.12%

Ti 336.121 At	281717.1	1.01768 mg/L	0.000266	1.01768 mg/L	0.000266	0.03%

QC value within limits for Ti 336.121 A Recovery = 101.77%

Tl 190.801 At	715.5	0.964208 mg/L	0.0064247	0.964208 mg/L	0.0064247	0.67%

QC value within limits for Tl 190.801 A Recovery = 96.42%

U 385.958 At	1183.2	-0.005446 mg/L	0.0019366	-0.005446 mg/L	0.0019366	35.56%

QC value less than the lower limit for U 385.958 A Recovery = -0.54%

V 292.402 At	81198.3	1.00910 mg/L	0.004239	1.00910 mg/L	0.004239	0.42%

QC value within limits for V 292.402 A Recovery = 100.91%

Zn 206.200 At	8359.9	0.944132 mg/L	0.0055632	0.944132 mg/L	0.0055632	0.59%

QC value within limits for Zn 206.200 A Recovery = 94.41%

QC Failed. Continue with analysis.

Sequence No.: 3
Sample ID: W9D0297-01
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 40
Date Collected: 4/27/2009 11:57:54 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0297-01

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	124497.8	99.5152	%	0.48068				0.48%
Lu 261.542 A	2316894.6	97.5199	%	0.11822				0.12%
Ag 328.068 At	-7.4	0.000124	mg/L	0.0002821	0.000124	mg/L	0.0002821	227.69%
Al 308.215 Rt	7457.2	6.18720	mg/L	0.016761	6.18720	mg/L	0.016761	0.27%
As 188.979 At	32.3	0.040297	mg/L	0.0016554	0.040297	mg/L	0.0016554	4.11%
B 249.677 Rt	46.2	0.024894	mg/L	0.0003360	0.024894	mg/L	0.0003360	1.35%
Ba 233.527 At	1416.0	0.035646	mg/L	0.0000145	0.035646	mg/L	0.0000145	0.04%
Be 313.107 Rt	33.1	0.000242	mg/L	0.0000034	0.000242	mg/L	0.0000034	1.39%
Bi 222.821 At	7.0	0.015443	mg/L	0.0044102	0.015443	mg/L	0.0044102	28.56%
Ca 315.887 Rt	46046.9	13.2711	mg/L	0.01763	13.2711	mg/L	0.01763	0.13%
Cd 226.502 At	23.7	0.000097	mg/L	0.0000520	0.000097	mg/L	0.0000520	53.54%
Ce 418.660 At	296.4	0.004878	mg/L	0.0001182	0.004878	mg/L	0.0001182	2.42%
Co 228.616 At	1.0	-0.000148	mg/L	0.0001354	-0.000148	mg/L	0.0001354	91.44%
Cr 267.716 At	186.5	0.004908	mg/L	0.0000783	0.004908	mg/L	0.0000783	1.59%
Cu 324.752 At	10697.9	0.063762	mg/L	0.0002562	0.063762	mg/L	0.0002562	0.40%
Fe 273.955 Rt	1819.9	3.21422	mg/L	0.007288	3.21422	mg/L	0.007288	0.23%
Ga 417.206 At	235.2	0.001688	mg/L	0.0000647	0.001688	mg/L	0.0000647	3.83%
K 766.490 Rt	10966.3	4.42179	mg/L	0.013307	4.42179	mg/L	0.013307	0.30%
La 379.478 At	784.0	0.003162	mg/L	0.0000116	0.003162	mg/L	0.0000116	0.37%
Li 670.784 Rt	366.5	0.003398	mg/L	0.0000394	0.003398	mg/L	0.0000394	1.16%
Mg 279.077 Rt	2120.3	4.30283	mg/L	0.011165	4.30283	mg/L	0.011165	0.26%
Mn 260.568 Rt	2322.7	0.179486	mg/L	0.0002307	0.179486	mg/L	0.0002307	0.13%
Mo 202.031 At	26.0	0.003130	mg/L	0.0002185	0.003130	mg/L	0.0002185	6.98%
Na 589.592 Rt	15003.8	2.11760	mg/L	0.028108	2.11760	mg/L	0.028108	1.33%
Ni 232.003 At	-45.3	0.000268	mg/L	0.0002198	0.000268	mg/L	0.0002198	82.12%
P 213.617 At	367.8	0.241385	mg/L	0.0003188	0.241385	mg/L	0.0003188	0.13%
Pb 220.353 At	81.0	0.024537	mg/L	0.0003056	0.024537	mg/L	0.0003056	1.25%
Sb 206.836 At	3.6	0.002270	mg/L	0.0017194	0.002270	mg/L	0.0017194	75.75%
Sc 361.383 At	1196.6	0.000985	mg/L	0.0000048	0.000985	mg/L	0.0000048	0.49%
Se 196.026 At	-3.7	-0.008716	mg/L	0.0006346	-0.008716	mg/L	0.0006346	7.28%
Si 251.611 Rt	18286.4	13.6476	mg/L	0.00308	13.6476	mg/L	0.00308	0.02%
SIO2 251.611 Rt	18286.4	29.2059	mg/L	0.00660	29.2059	mg/L	0.00660	0.02%
Sn 189.927 At	-11.4	-0.004382	mg/L	0.0008435	-0.004382	mg/L	0.0008435	19.25%
Sr 421.552 Rt	8119.0	0.011232	mg/L	0.0000543	0.011232	mg/L	0.0000543	0.48%
Ti 336.121 At	16314.6	0.064685	mg/L	0.0003879	0.064685	mg/L	0.0003879	0.60%
Tl 190.801 At	0.1	0.000711	mg/L	0.0005158	0.000711	mg/L	0.0005158	72.51%
U 385.958 At	173.9	0.001104	mg/L	0.0001045	0.001104	mg/L	0.0001045	9.47%
V 292.402 At	912.8	0.011035	mg/L	0.0001787	0.011035	mg/L	0.0001787	1.62%
Zn 206.200 At	765.2	0.086487	mg/L	0.0004880	0.086487	mg/L	0.0004880	0.56%

Sequence No.: 4
Sample ID: W917039-MS1
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 41
Date Collected: 4/27/2009 12:03:41 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W917039-MS1

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	121957.2	97.4844	%	0.51378				0.53%
Lu 261.542 A	2266117.6	95.3827	%	0.02235				0.02%
Ag 328.068 At	6840.6	0.051082	mg/L	0.0001806	0.051082	mg/L	0.0001806	0.35%
Al 308.215 Rt	8952.5	7.38707	mg/L	0.066206	7.38707	mg/L	0.066206	0.90%
As 188.979 At	823.6	0.992421	mg/L	0.0020214	0.992421	mg/L	0.0020214	0.20%
B 249.677 Rt	1924.6	1.03242	mg/L	0.007754	1.03242	mg/L	0.007754	0.75%
Ba 233.527 At	41024.9	1.03535	mg/L	0.005371	1.03535	mg/L	0.005371	0.52%
Be 313.107 Rt	130643.3	0.978318	mg/L	0.0019101	0.978318	mg/L	0.0019101	0.20%
Bi 222.821 At	1111.8	0.963676	mg/L	0.0064774	0.963676	mg/L	0.0064774	0.67%
Ca 315.887 Rt	112975.3	32.5561	mg/L	0.07708	32.5561	mg/L	0.07708	0.24%
Cd 226.502 At	31151.5	0.964008	mg/L	0.0057721	0.964008	mg/L	0.0057721	0.60%
Ce 418.660 At	82.8	0.004559	mg/L	0.0000969	0.004559	mg/L	0.0000969	2.13%
Co 228.616 At	15931.6	0.975340	mg/L	0.0051634	0.975340	mg/L	0.0051634	0.53%
Cr 267.716 At	37401.8	0.994374	mg/L	0.0048729	0.994374	mg/L	0.0048729	0.49%
Cu 324.752 At	183817.2	1.09561	mg/L	0.000406	1.09561	mg/L	0.000406	0.04%
Fe 273.955 Rt	7067.1	12.4729	mg/L	0.15524	12.4729	mg/L	0.15524	1.24%
Ga 417.206 At	82099.4	0.965811	mg/L	0.0037069	0.965811	mg/L	0.0037069	0.38%
K 766.490 Rt	61603.9	24.8396	mg/L	0.03461	24.8396	mg/L	0.03461	0.14%
La 379.478 At	216547.9	1.01169	mg/L	0.000001	1.01169	mg/L	0.000001	0.00%
Li 670.784 Rt	108244.7	1.00361	mg/L	0.003547	1.00361	mg/L	0.003547	0.35%
Mg 279.077 Rt	12217.4	24.7974	mg/L	0.15094	24.7974	mg/L	0.15094	0.61%
Mn 260.568 Rt	15017.3	1.16053	mg/L	0.011825	1.16053	mg/L	0.011825	1.02%
Mo 202.031 At	7939.3	1.00687	mg/L	0.003512	1.00687	mg/L	0.003512	0.35%
Na 589.592 Rt	156633.4	22.1069	mg/L	0.17721	22.1069	mg/L	0.17721	0.80%
Ni 232.003 At	9409.5	0.949547	mg/L	0.0030527	0.949547	mg/L	0.0030527	0.32%
P 213.617 At	1805.4	1.16856	mg/L	0.003973	1.16856	mg/L	0.003973	0.34%
Pb 220.353 At	3465.7	0.990713	mg/L	0.0001886	0.990713	mg/L	0.0001886	0.02%
Sb 206.836 At	1583.1	0.968443	mg/L	0.0034928	0.968443	mg/L	0.0034928	0.36%
Sc 361.383 At	592122.5	0.491426	mg/L	0.0004694	0.491426	mg/L	0.0004694	0.10%
Se 196.026 At	384.5	0.886112	mg/L	0.0059652	0.886112	mg/L	0.0059652	0.67%
Si 251.611 Rt	19049.2	14.1640	mg/L	0.13357	14.1640	mg/L	0.13357	0.94%
SIO2 251.611 Rt	19049.2	30.3118	mg/L	0.28584	30.3118	mg/L	0.28584	0.94%
Sn 189.927 At	2344.3	0.965642	mg/L	0.0003632	0.965642	mg/L	0.0003632	0.04%
Sr 421.552 Rt	707282.3	0.992283	mg/L	0.0029881	0.992283	mg/L	0.0029881	0.30%
Ti 336.121 At	295409.0	1.07225	mg/L	0.001778	1.07225	mg/L	0.001778	0.17%
Tl 190.801 At	715.1	0.964319	mg/L	0.0042467	0.964319	mg/L	0.0042467	0.44%
U 385.958 At	1365.3	-0.002901	mg/L	0.0002053	-0.002901	mg/L	0.0002053	7.08%
V 292.402 At	82139.4	1.02050	mg/L	0.005043	1.02050	mg/L	0.005043	0.49%
Zn 206.200 At	9003.0	1.01678	mg/L	0.006226	1.01678	mg/L	0.006226	0.61%

Matrix Recovery Check: W917039-MS1

Analyte	Expected Conc.	Measured Conc.	Std. Dev.	Units	Recovery (%)
Al 308.215 R	7.18720	7.38707	0.066	mg/L	120.0
B 249.677 R	1.02489	1.03242	0.008	mg/L	100.8
Be 313.107 R	1.00024	0.978318	0.002	mg/L	97.8
Ca 315.887 R	33.2711	32.5561	0.077	mg/L	96.4
Fe 273.955 R	13.2142	12.4729	0.155	mg/L	92.6
K 766.490 R	24.4218	24.8396	0.035	mg/L	102.1
Li 670.784 R	1.00340	1.00361	0.004	mg/L	100.0
Mg 279.077 R	24.3028	24.7974	0.151	mg/L	102.5
Mn 260.568 R	1.17949	1.16053	0.012	mg/L	98.1
Na 589.592 R	21.1176	22.1069	0.177	mg/L	105.2
Si 251.611 R	18.6476	14.1640	0.134	mg/L	10.3
SIO2 251.611 R	39.9059	30.3118	0.286	mg/L	10.3
Sr 421.552 R	1.01123	0.992283	0.003	mg/L	98.1
Ag 328.068 A	0.050124	0.051082	0.000	mg/L	101.9
As 188.979 A	1.04030	0.992421	0.002	mg/L	95.2
Ba 233.527 A	1.03565	1.03535	0.005	mg/L	100.0

Bi 222.821 A	1.01544	0.963676	0.006	mg/L	94.8
Cd 226.502 A	1.00010	0.964008	0.006	mg/L	96.4
Co 228.616 A	0.999852	0.975340	0.005	mg/L	97.5
Cr 267.716 A	1.00491	0.994374	0.005	mg/L	98.9
Cu 324.752 A	1.06376	1.09561	0.000	mg/L	103.2
Ga 417.206 A	1.00169	0.965811	0.004	mg/L	96.4
La 379.478 A	1.00316	1.01169	0.000	mg/L	100.9
Mo 202.031 A	1.00313	1.00687	0.004	mg/L	100.4
Ni 232.003 A	1.00027	0.949547	0.003	mg/L	94.9
P 213.617 A	1.24139	1.16856	0.004	mg/L	92.7
Pb 220.353 A	1.02454	0.990713	0.000	mg/L	96.6
Sb 206.836 A	1.00227	0.968443	0.003	mg/L	96.6
Sc 361.383 A	0.500985	0.491426	0.000	mg/L	98.1
Se 196.026 A	0.991284	0.886112	0.006	mg/L	89.5
Sn 189.927 A	0.995618	0.965642	0.000	mg/L	97.0
Ti 336.121 A	1.06469	1.07225	0.002	mg/L	100.8
Tl 190.801 A	1.00071	0.964319	0.004	mg/L	96.4
U 385.958 A	1.00110	-0.002901	0.000	mg/L	-0.4
V 292.402 A	1.01104	1.02050	0.005	mg/L	100.9
Zn 206.200 A	1.08649	1.01678	0.006	mg/L	93.0

Sequence No.: 5
Sample ID: W917039-MSD1
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 42
Date Collected: 4/27/2009 12:09:17 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W917039-MSD1

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	122525.5	97.9387	%	0.25092				0.26%
Lu 261.542 A	2274180.9	95.7221	%	0.25462				0.27%
Ag 328.068 At	6818.8	0.050951	mg/L	0.0001166	0.050951	mg/L	0.0001166	0.23%
Al 308.215 Rt	10245.4	8.45985	mg/L	0.054274	8.45985	mg/L	0.054274	0.64%
As 188.979 At	834.3	1.00584	mg/L	0.010343	1.00584	mg/L	0.010343	1.03%
B 249.677 Rt	1903.0	1.02081	mg/L	0.014460	1.02081	mg/L	0.014460	1.42%
Ba 233.527 At	41322.1	1.04284	mg/L	0.004284	1.04284	mg/L	0.004284	0.41%
Be 313.107 Rt	130350.0	0.976121	mg/L	0.0034501	0.976121	mg/L	0.0034501	0.35%
Bi 222.821 At	1123.0	0.974431	mg/L	0.0011222	0.974431	mg/L	0.0011222	0.12%
Ca 315.887 Rt	112893.5	32.5326	mg/L	0.01664	32.5326	mg/L	0.01664	0.05%
Cd 226.502 At	31256.2	0.967158	mg/L	0.0042512	0.967158	mg/L	0.0042512	0.44%
Ce 418.660 At	84.7	0.004598	mg/L	0.0000325	0.004598	mg/L	0.0000325	0.71%
Co 228.616 At	15993.9	0.979133	mg/L	0.0041206	0.979133	mg/L	0.0041206	0.42%
Cr 267.716 At	37460.1	0.995922	mg/L	0.0021644	0.995922	mg/L	0.0021644	0.22%
Cu 324.752 At	183415.2	1.09322	mg/L	0.000482	1.09322	mg/L	0.000482	0.04%
Fe 273.955 Rt	7342.2	12.9588	mg/L	0.06477	12.9588	mg/L	0.06477	0.50%
Ga 417.206 At	82181.5	0.966640	mg/L	0.0016999	0.966640	mg/L	0.0016999	0.18%
K 766.490 Rt	62128.8	25.0513	mg/L	0.19788	25.0513	mg/L	0.19788	0.79%
La 379.478 At	215968.2	1.00890	mg/L	0.000603	1.00890	mg/L	0.000603	0.06%
Li 670.784 Rt	107328.2	0.995113	mg/L	0.0111633	0.995113	mg/L	0.0111633	1.12%
Mg 279.077 Rt	12125.9	24.6114	mg/L	0.21065	24.6114	mg/L	0.21065	0.86%
Mn 260.568 Rt	14968.2	1.15669	mg/L	0.010897	1.15669	mg/L	0.010897	0.94%
Mo 202.031 At	7959.9	1.00949	mg/L	0.002504	1.00949	mg/L	0.002504	0.25%
Na 589.592 Rt	153748.0	21.6997	mg/L	0.34287	21.6997	mg/L	0.34287	1.58%
Ni 232.003 At	9412.1	0.950275	mg/L	0.0023693	0.950275	mg/L	0.0023693	0.25%
P 213.617 At	1828.0	1.18384	mg/L	0.012156	1.18384	mg/L	0.012156	1.03%
Pb 220.353 At	3502.2	1.00125	mg/L	0.005561	1.00125	mg/L	0.005561	0.56%
Sb 206.836 At	1589.3	0.972291	mg/L	0.0105728	0.972291	mg/L	0.0105728	1.09%
Sc 361.383 At	591532.3	0.490936	mg/L	0.0009626	0.490936	mg/L	0.0009626	0.20%
Se 196.026 At	386.8	0.891577	mg/L	0.0083137	0.891577	mg/L	0.0083137	0.93%
Si 251.611 Rt	20075.9	14.9301	mg/L	0.09478	14.9301	mg/L	0.09478	0.63%
SIO2 251.611 Rt	20075.9	31.9513	mg/L	0.20283	31.9513	mg/L	0.20283	0.63%
Sn 189.927 At	2366.8	0.974897	mg/L	0.0042057	0.974897	mg/L	0.0042057	0.43%
Sr 421.552 Rt	702615.1	0.985733	mg/L	0.0060807	0.985733	mg/L	0.0060807	0.62%
Ti 336.121 At	297621.7	1.08117	mg/L	0.001903	1.08117	mg/L	0.001903	0.18%
Tl 190.801 At	714.7	0.963821	mg/L	0.0025466	0.963821	mg/L	0.0025466	0.26%
U 385.958 At	1384.4	-0.003031	mg/L	0.0002448	-0.003031	mg/L	0.0002448	8.08%
V 292.402 At	82205.0	1.02130	mg/L	0.004525	1.02130	mg/L	0.004525	0.44%
Zn 206.200 At	9148.1	1.03321	mg/L	0.003425	1.03321	mg/L	0.003425	0.33%

Sequence No.: 6
Sample ID: W9D0297-02
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 43
Date Collected: 4/27/2009 12:14:50 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0297-02

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	124298.3	99.3557	%	0.43749				0.44%
Lu 261.542 A	2324566.4	97.8429	%	0.28167				0.29%
Ag 328.068 At	32.5	0.000367	mg/L	0.0001411	0.000367	mg/L	0.0001411	38.43%
Al 308.215 Rt	6259.8	5.19356	mg/L	0.009644	5.19356	mg/L	0.009644	0.19%
As 188.979 At	51.4	0.064008	mg/L	0.0019909	0.064008	mg/L	0.0019909	3.11%
B 249.677 Rt	68.9	0.037048	mg/L	0.0009136	0.037048	mg/L	0.0009136	2.47%
Ba 233.527 At	1714.2	0.043195	mg/L	0.0001136	0.043195	mg/L	0.0001136	0.26%
Be 313.107 Rt	22.9	0.000166	mg/L	0.0000359	0.000166	mg/L	0.0000359	21.62%
Bi 222.821 At	11.5	0.020270	mg/L	0.0028803	0.020270	mg/L	0.0028803	14.21%
Ca 315.887 Rt	56910.3	16.4018	mg/L	0.00608	16.4018	mg/L	0.00608	0.04%
Cd 226.502 At	20.0	0.000125	mg/L	0.0000635	0.000125	mg/L	0.0000635	50.77%
Ce 418.660 At	258.4	0.004258	mg/L	0.0003727	0.004258	mg/L	0.0003727	8.75%
Co 228.616 At	-6.5	-0.000587	mg/L	0.0001690	-0.000587	mg/L	0.0001690	28.79%
Cr 267.716 At	142.3	0.003743	mg/L	0.0000999	0.003743	mg/L	0.0000999	2.67%
Cu 324.752 At	20800.7	0.123951	mg/L	0.0003410	0.123951	mg/L	0.0003410	0.28%
Fe 273.955 Rt	1405.7	2.48259	mg/L	0.001444	2.48259	mg/L	0.001444	0.06%
Ga 417.206 At	187.4	0.001304	mg/L	0.0003082	0.001304	mg/L	0.0003082	23.64%
K 766.490 Rt	8027.0	3.23661	mg/L	0.003112	3.23661	mg/L	0.003112	0.10%
La 379.478 At	677.4	0.002771	mg/L	0.0000101	0.002771	mg/L	0.0000101	0.37%
Li 670.784 Rt	336.9	0.003124	mg/L	0.0000055	0.003124	mg/L	0.0000055	0.18%
Mg 279.077 Rt	1518.5	3.08152	mg/L	0.001192	3.08152	mg/L	0.001192	0.04%
Mn 260.568 Rt	2964.1	0.229221	mg/L	0.0002529	0.229221	mg/L	0.0002529	0.11%
Mo 202.031 At	31.6	0.003791	mg/L	0.0003463	0.003791	mg/L	0.0003463	9.14%
Na 589.592 Rt	27996.0	3.95129	mg/L	0.044282	3.95129	mg/L	0.044282	1.12%
Ni 232.003 At	-38.6	0.000405	mg/L	0.0004681	0.000405	mg/L	0.0004681	115.51%
P 213.617 At	262.3	0.169917	mg/L	0.0011414	0.169917	mg/L	0.0011414	0.67%
Pb 220.353 At	110.2	0.032746	mg/L	0.0024692	0.032746	mg/L	0.0024692	7.54%
Sb 206.836 At	8.9	0.005488	mg/L	0.0028059	0.005488	mg/L	0.0028059	51.13%
Sc 361.383 At	855.3	0.000700	mg/L	0.0000045	0.000700	mg/L	0.0000045	0.65%
Se 196.026 At	-1.7	-0.004135	mg/L	0.0048921	-0.004135	mg/L	0.0048921	118.31%
Si 251.611 Rt	17382.8	12.9734	mg/L	0.01147	12.9734	mg/L	0.01147	0.09%
SIO2 251.611 Rt	17382.8	27.7630	mg/L	0.02455	27.7630	mg/L	0.02455	0.09%
Sn 189.927 At	-9.0	-0.003310	mg/L	0.0001546	-0.003310	mg/L	0.0001546	4.67%
Sr 421.552 Rt	10731.1	0.014860	mg/L	0.0000147	0.014860	mg/L	0.0000147	0.10%
Ti 336.121 At	14967.7	0.059357	mg/L	0.0002674	0.059357	mg/L	0.0002674	0.45%
Tl 190.801 At	0.3	0.001155	mg/L	0.0005021	0.001155	mg/L	0.0005021	43.46%
U 385.958 At	144.7	0.001278	mg/L	0.0006048	0.001278	mg/L	0.0006048	47.34%
V 292.402 At	626.4	0.007572	mg/L	0.0000648	0.007572	mg/L	0.0000648	0.86%
Zn 206.200 At	693.5	0.078386	mg/L	0.0003282	0.078386	mg/L	0.0003282	0.42%

Sequence No.: 7
Sample ID: W9D0297-03
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 44
Date Collected: 4/27/2009 12:20:36 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0297-03

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	123550.4	98.7579	%	0.22758				0.23%
Lu 261.542 A	2312090.3	97.3177	%	0.13083				0.13%
Ag 328.068 At	88.3	0.000777	mg/L	0.0001286	0.000777	mg/L	0.0001286	16.55%
Al 308.215 Rt	6347.2	5.26571	mg/L	0.006925	5.26571	mg/L	0.006925	0.13%
As 188.979 At	81.8	0.101960	mg/L	0.0004576	0.101960	mg/L	0.0004576	0.45%
B 249.677 Rt	63.7	0.034243	mg/L	0.0009817	0.034243	mg/L	0.0009817	2.87%
Ba 233.527 At	1800.4	0.045367	mg/L	0.0000515	0.045367	mg/L	0.0000515	0.11%
Be 313.107 Rt	17.2	0.000119	mg/L	0.0000090	0.000119	mg/L	0.0000090	7.54%
Bi 222.821 At	10.5	0.022575	mg/L	0.0023956	0.022575	mg/L	0.0023956	10.61%
Ca 315.887 Rt	63822.4	18.3939	mg/L	0.00650	18.3939	mg/L	0.00650	0.04%
Cd 226.502 At	20.8	0.000118	mg/L	0.0001286	0.000118	mg/L	0.0001286	108.76%
Ce 418.660 At	330.0	0.005446	mg/L	0.0004883	0.005446	mg/L	0.0004883	8.97%
Co 228.616 At	7.0	0.000156	mg/L	0.0000728	0.000156	mg/L	0.0000728	46.68%
Cr 267.716 At	187.5	0.004941	mg/L	0.0000458	0.004941	mg/L	0.0000458	0.93%
Cu 324.752 At	54651.6	0.325649	mg/L	0.0019184	0.325649	mg/L	0.0019184	0.59%
Fe 273.955 Rt	1482.4	2.61821	mg/L	0.004178	2.61821	mg/L	0.004178	0.16%
Ga 417.206 At	206.8	0.001265	mg/L	0.0000158	0.001265	mg/L	0.0000158	1.25%
K 766.490 Rt	7015.6	2.82882	mg/L	0.009993	2.82882	mg/L	0.009993	0.35%
La 379.478 At	857.5	0.003583	mg/L	0.0001002	0.003583	mg/L	0.0001002	2.80%
Li 670.784 Rt	509.1	0.004720	mg/L	0.0000428	0.004720	mg/L	0.0000428	0.91%
Mg 279.077 Rt	1127.3	2.28736	mg/L	0.003925	2.28736	mg/L	0.003925	0.17%
Mn 260.568 Rt	4311.9	0.333583	mg/L	0.0000326	0.333583	mg/L	0.0000326	0.01%
Mo 202.031 At	27.1	0.003188	mg/L	0.0000719	0.003188	mg/L	0.0000719	2.26%
Na 589.592 Rt	27044.3	3.81698	mg/L	0.070208	3.81698	mg/L	0.070208	1.84%
Ni 232.003 At	-8.7	0.004213	mg/L	0.0002929	0.004213	mg/L	0.0002929	6.95%
P 213.617 At	426.9	0.271412	mg/L	0.0011798	0.271412	mg/L	0.0011798	0.43%
Pb 220.353 At	106.5	0.031751	mg/L	0.0025735	0.031751	mg/L	0.0025735	8.11%
Sb 206.836 At	14.0	0.008550	mg/L	0.0003788	0.008550	mg/L	0.0003788	4.43%
Sc 361.383 At	1183.5	0.000968	mg/L	0.0000103	0.000968	mg/L	0.0000103	1.07%
Se 196.026 At	-3.5	-0.008073	mg/L	0.0025366	-0.008073	mg/L	0.0025366	31.42%
Si 251.611 Rt	20399.6	15.2248	mg/L	0.04474	15.2248	mg/L	0.04474	0.29%
SIO2 251.611 Rt	20399.6	32.5810	mg/L	0.09575	32.5810	mg/L	0.09575	0.29%
Sn 189.927 At	-12.2	-0.004608	mg/L	0.0000924	-0.004608	mg/L	0.0000924	2.01%
Sr 421.552 Rt	9208.9	0.012699	mg/L	0.0000669	0.012699	mg/L	0.0000669	0.53%
Ti 336.121 At	24092.3	0.095635	mg/L	0.0003379	0.095635	mg/L	0.0003379	0.35%
Tl 190.801 At	-0.7	0.000047	mg/L	0.0002646	0.000047	mg/L	0.0002646	562.75%
U 385.958 At	158.6	0.001627	mg/L	0.0006260	0.001627	mg/L	0.0006260	38.49%
V 292.402 At	847.3	0.010265	mg/L	0.0001083	0.010265	mg/L	0.0001083	1.06%
Zn 206.200 At	538.5	0.060800	mg/L	0.0004181	0.060800	mg/L	0.0004181	0.69%

Sequence No.: 8
Sample ID: W9D0297-04
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 45
Date Collected: 4/27/2009 12:26:23 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0297-04

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	125531.2	100.341	%	0.4725				0.47%
Lu 261.542 A	2338022.4	98.4092	%	0.14348				0.15%
Ag 328.068 At	68.8	0.000601	mg/L	0.0000324	0.000601	mg/L	0.0000324	5.39%
Al 308.215 Rt	4370.8	3.62616	mg/L	0.023740	3.62616	mg/L	0.023740	0.65%
As 188.979 At	106.8	0.132959	mg/L	0.0002294	0.132959	mg/L	0.0002294	0.17%
B 249.677 Rt	39.7	0.021372	mg/L	0.0012724	0.021372	mg/L	0.0012724	5.95%
Ba 233.527 At	1102.8	0.027786	mg/L	0.0000547	0.027786	mg/L	0.0000547	0.20%
Be 313.107 Rt	12.5	0.000088	mg/L	0.0000185	0.000088	mg/L	0.0000185	21.02%
Bi 222.821 At	9.6	0.019166	mg/L	0.0037952	0.019166	mg/L	0.0037952	19.80%
Ca 315.887 Rt	52760.2	15.2059	mg/L	0.05572	15.2059	mg/L	0.05572	0.37%
Cd 226.502 At	10.7	-0.000003	mg/L	0.0000477	-0.000003	mg/L	0.0000477	>999.9%
Ce 418.660 At	230.6	0.003801	mg/L	0.0002243	0.003801	mg/L	0.0002243	5.90%
Co 228.616 At	-2.0	-0.000274	mg/L	0.0001104	-0.000274	mg/L	0.0001104	40.31%
Cr 267.716 At	124.9	0.003294	mg/L	0.0001536	0.003294	mg/L	0.0001536	4.66%
Cu 324.752 At	51965.0	0.309620	mg/L	0.0016092	0.309620	mg/L	0.0016092	0.52%
Fe 273.955 Rt	950.0	1.67777	mg/L	0.010785	1.67777	mg/L	0.010785	0.64%
Ga 417.206 At	134.6	0.000872	mg/L	0.0002887	0.000872	mg/L	0.0002887	33.13%
K 766.490 Rt	5187.1	2.09153	mg/L	0.013549	2.09153	mg/L	0.013549	0.65%
La 379.478 At	595.4	0.002499	mg/L	0.0001111	0.002499	mg/L	0.0001111	4.44%
Li 670.784 Rt	312.7	0.002899	mg/L	0.0000675	0.002899	mg/L	0.0000675	2.33%
Mg 279.077 Rt	850.5	1.72555	mg/L	0.022743	1.72555	mg/L	0.022743	1.32%
Mn 260.568 Rt	1529.7	0.118266	mg/L	0.0013875	0.118266	mg/L	0.0013875	1.17%
Mo 202.031 At	24.1	0.002853	mg/L	0.0000449	0.002853	mg/L	0.0000449	1.57%
Na 589.592 Rt	16530.5	2.33308	mg/L	0.040567	2.33308	mg/L	0.040567	1.74%
Ni 232.003 At	-7.2	0.002446	mg/L	0.0006459	0.002446	mg/L	0.0006459	26.41%
P 213.617 At	332.4	0.209038	mg/L	0.0032294	0.209038	mg/L	0.0032294	1.54%
Pb 220.353 At	75.3	0.022467	mg/L	0.0019181	0.022467	mg/L	0.0019181	8.54%
Sb 206.836 At	8.6	0.005297	mg/L	0.0010284	0.005297	mg/L	0.0010284	19.42%
Sc 361.383 At	773.8	0.000636	mg/L	0.0000027	0.000636	mg/L	0.0000027	0.42%
Se 196.026 At	-1.7	-0.004020	mg/L	0.0001065	-0.004020	mg/L	0.0001065	2.65%
Si 251.611 Rt	14945.3	11.1542	mg/L	0.06366	11.1542	mg/L	0.06366	0.57%
SIO2 251.611 Rt	14945.3	23.8700	mg/L	0.13624	23.8700	mg/L	0.13624	0.57%
Sn 189.927 At	-8.6	-0.003193	mg/L	0.0002987	-0.003193	mg/L	0.0002987	9.35%
Sr 421.552 Rt	7837.3	0.010813	mg/L	0.0000756	0.010813	mg/L	0.0000756	0.70%
Ti 336.121 At	13575.0	0.053832	mg/L	0.0001948	0.053832	mg/L	0.0001948	0.36%
Tl 190.801 At	-0.9	-0.000808	mg/L	0.0020144	-0.000808	mg/L	0.0020144	249.33%
U 385.958 At	105.7	0.001190	mg/L	0.0012034	0.001190	mg/L	0.0012034	101.14%
V 292.402 At	790.7	0.009633	mg/L	0.0000945	0.009633	mg/L	0.0000945	0.98%
Zn 206.200 At	446.2	0.050444	mg/L	0.0002432	0.050444	mg/L	0.0002432	0.48%

Sequence No.: 9
Sample ID: W9D0297-05
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 46
Date Collected: 4/27/2009 12:32:08 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0297-05

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	125439.1	100.268	%	0.5681				0.57%
Lu 261.542 A	2336776.4	98.3568	%	0.62539				0.64%
Ag 328.068 At	93.7	0.000812	mg/L	0.0001203	0.000812	mg/L	0.0001203	14.81%
Al 308.215 Rt	5619.2	4.66214	mg/L	0.021860	4.66214	mg/L	0.021860	0.47%
As 188.979 At	128.8	0.160309	mg/L	0.0022473	0.160309	mg/L	0.0022473	1.40%
B 249.677 Rt	59.6	0.032017	mg/L	0.0011764	0.032017	mg/L	0.0011764	3.67%
Ba 233.527 At	1220.4	0.030746	mg/L	0.0002102	0.030746	mg/L	0.0002102	0.68%
Be 313.107 Rt	17.9	0.000129	mg/L	0.0000010	0.000129	mg/L	0.0000010	0.80%
Bi 222.821 At	8.7	0.017401	mg/L	0.0011179	0.017401	mg/L	0.0011179	6.42%
Ca 315.887 Rt	68145.9	19.6403	mg/L	0.00275	19.6403	mg/L	0.00275	0.01%
Cd 226.502 At	23.6	0.000329	mg/L	0.0002598	0.000329	mg/L	0.0002598	78.99%
Ce 418.660 At	337.7	0.005560	mg/L	0.0001426	0.005560	mg/L	0.0001426	2.56%
Co 228.616 At	-0.2	-0.000175	mg/L	0.0000069	-0.000175	mg/L	0.0000069	3.92%
Cr 267.716 At	162.4	0.004289	mg/L	0.0000080	0.004289	mg/L	0.0000080	0.19%
Cu 324.752 At	49040.6	0.292198	mg/L	0.0022482	0.292198	mg/L	0.0022482	0.77%
Fe 273.955 Rt	1136.9	2.00799	mg/L	0.001005	2.00799	mg/L	0.001005	0.05%
Ga 417.206 At	167.8	0.001153	mg/L	0.0000775	0.001153	mg/L	0.0000775	6.72%
K 766.490 Rt	12457.8	5.02320	mg/L	0.010014	5.02320	mg/L	0.010014	0.20%
La 379.478 At	765.8	0.003244	mg/L	0.0000478	0.003244	mg/L	0.0000478	1.48%
Li 670.784 Rt	313.6	0.002908	mg/L	0.0002042	0.002908	mg/L	0.0002042	7.02%
Mg 279.077 Rt	753.5	1.52848	mg/L	0.000504	1.52848	mg/L	0.000504	0.03%
Mn 260.568 Rt	1306.6	0.100983	mg/L	0.0003968	0.100983	mg/L	0.0003968	0.39%
Mo 202.031 At	27.9	0.003269	mg/L	0.0003400	0.003269	mg/L	0.0003400	10.40%
Na 589.592 Rt	13085.9	1.84692	mg/L	0.003688	1.84692	mg/L	0.003688	0.20%
Ni 232.003 At	-35.1	-0.000306	mg/L	0.0001056	-0.000306	mg/L	0.0001056	34.58%
P 213.617 At	479.6	0.306172	mg/L	0.0010522	0.306172	mg/L	0.0010522	0.34%
Pb 220.353 At	94.9	0.028069	mg/L	0.0012067	0.028069	mg/L	0.0012067	4.30%
Sb 206.836 At	10.6	0.006525	mg/L	0.0019436	0.006525	mg/L	0.0019436	29.79%
Sc 361.383 At	771.7	0.000635	mg/L	0.0000047	0.000635	mg/L	0.0000047	0.74%
Se 196.026 At	-2.6	-0.005964	mg/L	0.0031238	-0.005964	mg/L	0.0031238	52.38%
Si 251.611 Rt	13767.4	10.2749	mg/L	0.01787	10.2749	mg/L	0.01787	0.17%
SIO2 251.611 Rt	13767.4	21.9882	mg/L	0.03824	21.9882	mg/L	0.03824	0.17%
Sn 189.927 At	-9.5	-0.003491	mg/L	0.0001296	-0.003491	mg/L	0.0001296	3.71%
Sr 421.552 Rt	11069.4	0.015295	mg/L	0.0000257	0.015295	mg/L	0.0000257	0.17%
Ti 336.121 At	14037.1	0.055641	mg/L	0.0002519	0.055641	mg/L	0.0002519	0.45%
Tl 190.801 At	-0.5	-0.000306	mg/L	0.0028510	-0.000306	mg/L	0.0028510	932.03%
U 385.958 At	105.8	0.000195	mg/L	0.0001097	0.000195	mg/L	0.0001097	56.20%
V 292.402 At	539.9	0.006524	mg/L	0.0001189	0.006524	mg/L	0.0001189	1.82%
Zn 206.200 At	429.3	0.048450	mg/L	0.0000204	0.048450	mg/L	0.0000204	0.04%

Sequence No.: 10
Sample ID: W9D0297-06
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 47
Date Collected: 4/27/2009 12:37:55 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0297-06

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	124247.7	99.3153	%	0.61931				0.62%
Lu 261.542 A	2320360.1	97.6658	%	0.12419				0.13%
Ag 328.068 At	116.5	0.000950	mg/L	0.0000332	0.000950	mg/L	0.0000332	3.50%
Al 308.215 Rt	4050.1	3.36015	mg/L	0.004324	3.36015	mg/L	0.004324	0.13%
As 188.979 At	141.4	0.176025	mg/L	0.0010609	0.176025	mg/L	0.0010609	0.60%
B 249.677 Rt	60.6	0.032545	mg/L	0.0008156	0.032545	mg/L	0.0008156	2.51%
Ba 233.527 At	1028.7	0.025921	mg/L	0.0000529	0.025921	mg/L	0.0000529	0.20%
Be 313.107 Rt	18.2	0.000133	mg/L	0.0000255	0.000133	mg/L	0.0000255	19.28%
Bi 222.821 At	5.1	0.013646	mg/L	0.0004288	0.013646	mg/L	0.0004288	3.14%
Ca 315.887 Rt	72347.4	20.8512	mg/L	0.01903	20.8512	mg/L	0.01903	0.09%
Cd 226.502 At	23.1	0.000410	mg/L	0.0001683	0.000410	mg/L	0.0001683	41.04%
Ce 418.660 At	275.5	0.004534	mg/L	0.0000059	0.004534	mg/L	0.0000059	0.13%
Co 228.616 At	-3.0	-0.000305	mg/L	0.0001895	-0.000305	mg/L	0.0001895	62.18%
Cr 267.716 At	118.5	0.003125	mg/L	0.0001690	0.003125	mg/L	0.0001690	5.41%
Cu 324.752 At	67396.7	0.401550	mg/L	0.0021030	0.401550	mg/L	0.0021030	0.52%
Fe 273.955 Rt	866.9	1.53110	mg/L	0.001635	1.53110	mg/L	0.001635	0.11%
Ga 417.206 At	113.2	0.000711	mg/L	0.0000746	0.000711	mg/L	0.0000746	10.49%
K 766.490 Rt	6456.0	2.60317	mg/L	0.017360	2.60317	mg/L	0.017360	0.67%
La 379.478 At	539.1	0.002253	mg/L	0.0000939	0.002253	mg/L	0.0000939	4.17%
Li 670.784 Rt	93.0	0.000862	mg/L	0.0002239	0.000862	mg/L	0.0002239	25.98%
Mg 279.077 Rt	645.3	1.30892	mg/L	0.009065	1.30892	mg/L	0.009065	0.69%
Mn 260.568 Rt	1165.4	0.090091	mg/L	0.0008169	0.090091	mg/L	0.0008169	0.91%
Mo 202.031 At	27.4	0.003177	mg/L	0.0002405	0.003177	mg/L	0.0002405	7.57%
Na 589.592 Rt	14024.2	1.97935	mg/L	0.037078	1.97935	mg/L	0.037078	1.87%
Ni 232.003 At	-34.0	-0.000823	mg/L	0.0001417	-0.000823	mg/L	0.0001417	17.21%
P 213.617 At	522.4	0.330119	mg/L	0.0035388	0.330119	mg/L	0.0035388	1.07%
Pb 220.353 At	106.1	0.030951	mg/L	0.0025838	0.030951	mg/L	0.0025838	8.35%
Sb 206.836 At	14.7	0.008992	mg/L	0.0011361	0.008992	mg/L	0.0011361	12.63%
Sc 361.383 At	517.4	0.000424	mg/L	0.0000032	0.000424	mg/L	0.0000032	0.75%
Se 196.026 At	-3.5	-0.008072	mg/L	0.0073339	-0.008072	mg/L	0.0073339	90.85%
Si 251.611 Rt	11082.6	8.27117	mg/L	0.028474	8.27117	mg/L	0.028474	0.34%
SIO2 251.611 Rt	11082.6	17.7003	mg/L	0.06093	17.7003	mg/L	0.06093	0.34%
Sn 189.927 At	-13.0	-0.004885	mg/L	0.0021506	-0.004885	mg/L	0.0021506	44.02%
Sr 421.552 Rt	11695.3	0.016158	mg/L	0.0000508	0.016158	mg/L	0.0000508	0.31%
Ti 336.121 At	10045.7	0.039775	mg/L	0.0001070	0.039775	mg/L	0.0001070	0.27%
Tl 190.801 At	-0.5	-0.000340	mg/L	0.0006624	-0.000340	mg/L	0.0006624	194.64%
U 385.958 At	96.7	0.000917	mg/L	0.0009955	0.000917	mg/L	0.0009955	108.52%
V 292.402 At	453.5	0.005502	mg/L	0.0000420	0.005502	mg/L	0.0000420	0.76%
Zn 206.200 At	448.5	0.050694	mg/L	0.0000178	0.050694	mg/L	0.0000178	0.04%

Sequence No.: 11
Sample ID: CCV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 6
Date Collected: 4/27/2009 12:43:42 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCV

Analyte	Mean Corrected Intensity	Calib. Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	124806.6	99.7620	%	0.11017				0.11%
Lu 261.542 A	2347283.6	98.7990	%	0.08193				0.08%
Ag 328.068 At	272259.1	2.00470	mg/L	0.014641	2.00470	mg/L	0.014641	0.73%
QC value within limits for Ag 328.068 A Recovery = 100.23%								
Al 308.215 Rt	2589.5	2.05043	mg/L	0.005015	2.05043	mg/L	0.005015	0.24%
QC value within limits for Al 308.215 R Recovery = 102.52%								
As 188.979 At	1721.7	2.01396	mg/L	0.004157	2.01396	mg/L	0.004157	0.21%
QC value within limits for As 188.979 A Recovery = 100.70%								
B 249.677 Rt	3775.6	2.02499	mg/L	0.003393	2.02499	mg/L	0.003393	0.17%
QC value within limits for B 249.677 R Recovery = 101.25%								
Ba 233.527 At	80030.8	2.02038	mg/L	0.025375	2.02038	mg/L	0.025375	1.26%
QC value within limits for Ba 233.527 A Recovery = 101.02%								
Be 313.107 Rt	263173.8	1.97085	mg/L	0.009265	1.97085	mg/L	0.009265	0.47%
QC value within limits for Be 313.107 R Recovery = 98.54%								
Bi 222.821 At	4179.9	3.75968	mg/L	0.010440	3.75968	mg/L	0.010440	0.28%
QC value within limits for Bi 222.821 A Recovery = 93.99%								
Ca 315.887 Rt	7022.4	2.01272	mg/L	0.004206	2.01272	mg/L	0.004206	0.21%
QC value within limits for Ca 315.887 R Recovery = 100.64%								
Cd 226.502 At	64598.5	2.00414	mg/L	0.020781	2.00414	mg/L	0.020781	1.04%
QC value within limits for Cd 226.502 A Recovery = 100.21%								
Ce 418.660 At	-446.2	-0.003158	mg/L	0.0002768	-0.003158	mg/L	0.0002768	8.77%
QC value within limits for Ce 418.660 A Recovery = Not calculated								
Co 228.616 At	32635.5	1.99864	mg/L	0.020289	1.99864	mg/L	0.020289	1.02%
QC value within limits for Co 228.616 A Recovery = 99.93%								
Cr 267.716 At	75413.7	2.00514	mg/L	0.015998	2.00514	mg/L	0.015998	0.80%
QC value within limits for Cr 267.716 A Recovery = 100.26%								
Cu 324.752 At	334939.1	1.99585	mg/L	0.007312	1.99585	mg/L	0.007312	0.37%
QC value within limits for Cu 324.752 A Recovery = 99.79%								
Fe 273.955 Rt	1154.1	2.02190	mg/L	0.001725	2.02190	mg/L	0.001725	0.09%
QC value within limits for Fe 273.955 R Recovery = 101.09%								
Ga 417.206 At	322253.2	3.81253	mg/L	0.005230	3.81253	mg/L	0.005230	0.14%
QC value within limits for Ga 417.206 A Recovery = 95.31%								
K 766.490 Rt	48956.8	19.7401	mg/L	0.00242	19.7401	mg/L	0.00242	0.01%
QC value within limits for K 766.490 R Recovery = 98.70%								
La 379.478 At	851401.0	3.98882	mg/L	0.001067	3.98882	mg/L	0.001067	0.03%
QC value within limits for La 379.478 A Recovery = 99.72%								
Li 670.784 Rt	417835.3	3.87404	mg/L	0.005406	3.87404	mg/L	0.005406	0.14%
QC value within limits for Li 670.784 R Recovery = 96.85%								
Mg 279.077 Rt	1002.9	2.04854	mg/L	0.007180	2.04854	mg/L	0.007180	0.35%
QC value within limits for Mg 279.077 R Recovery = 102.43%								
Mn 260.568 Rt	25419.5	1.96666	mg/L	0.004861	1.96666	mg/L	0.004861	0.25%
QC value within limits for Mn 260.568 R Recovery = 98.33%								
Mo 202.031 At	15827.8	2.00866	mg/L	0.016806	2.00866	mg/L	0.016806	0.84%
QC value within limits for Mo 202.031 A Recovery = 100.43%								
Na 589.592 Rt	142754.4	20.1481	mg/L	0.12145	20.1481	mg/L	0.12145	0.60%
QC value within limits for Na 589.592 R Recovery = 100.74%								
Ni 232.003 At	19902.3	1.98599	mg/L	0.017031	1.98599	mg/L	0.017031	0.86%
QC value within limits for Ni 232.003 A Recovery = 99.30%								
P 213.617 At	13961.7	9.11190	mg/L	0.007168	9.11190	mg/L	0.007168	0.08%
QC value within limits for P 213.617 A Recovery = 91.12%								
Pb 220.353 At	7043.3	2.01014	mg/L	0.002098	2.01014	mg/L	0.002098	0.10%
QC value within limits for Pb 220.353 A Recovery = 100.51%								
Sb 206.836 At	3254.5	1.99944	mg/L	0.006447	1.99944	mg/L	0.006447	0.32%
QC value within limits for Sb 206.836 A Recovery = 99.97%								
Sc 361.383 At	1199686.4	0.995670	mg/L	0.0003199	0.995670	mg/L	0.0003199	0.03%
QC value within limits for Sc 361.383 A Recovery = 99.57%								
Se 196.026 At	846.0	1.95973	mg/L	0.001874	1.95973	mg/L	0.001874	0.10%
QC value within limits for Se 196.026 A Recovery = 97.99%								
Si 251.611 Rt	13506.6	9.96584	mg/L	0.014107	9.96584	mg/L	0.014107	0.14%
QC value within limits for Si 251.611 R Recovery = 99.66%								

SIO2 251.611 R†	13506.6	21.3284	mg/L	0.03018	21.3284	mg/L	0.03018	0.14%
QC value within limits for SIO2 251.611 R Recovery = 99.67%								
Sn 189.927 A†	9562.9	3.93567	mg/L	0.001004	3.93567	mg/L	0.001004	0.03%
QC value within limits for Sn 189.927 A Recovery = 98.39%								
Sr 421.552 R†	1381775.7	1.93932	mg/L	0.000360	1.93932	mg/L	0.000360	0.02%
QC value within limits for Sr 421.552 R Recovery = 96.97%								
Ti 336.121 A†	556042.4	2.00351	mg/L	0.000603	2.00351	mg/L	0.000603	0.03%
QC value within limits for Ti 336.121 A Recovery = 100.18%								
Tl 190.801 A†	1491.8	2.00991	mg/L	0.003254	2.00991	mg/L	0.003254	0.16%
QC value within limits for Tl 190.801 A Recovery = 100.50%								
U 385.958 A†	19322.6	1.01163	mg/L	0.010249	1.01163	mg/L	0.010249	1.01%
V 292.402 A†	163652.1	2.03630	mg/L	0.013614	2.03630	mg/L	0.013614	0.67%
QC value within limits for V 292.402 A Recovery = 101.81%								
Zn 206.200 A†	17675.8	1.99733	mg/L	0.025372	1.99733	mg/L	0.025372	1.27%
QC value within limits for Zn 206.200 A Recovery = 99.87%								

All analyte(s) passed QC.

Sequence No.: 12
Sample ID: CCB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 1
Date Collected: 4/27/2009 12:49:43 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCB

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	123372.2	98.6154	%	0.11864				0.12%
Lu 261.542 A	2358591.9	99.2750	%	0.23333				0.24%
Ag 328.068 At	14.3	0.000106	mg/L	0.0000111	0.000106	mg/L	0.0000111	10.47%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	1.0	0.000803	mg/L	0.0010521	0.000803	mg/L	0.0010521	131.05%
QC value within limits for Al 308.215 R Recovery = Not calculated								
As 188.979 At	0.5	0.000622	mg/L	0.0031389	0.000622	mg/L	0.0031389	504.48%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	10.8	0.005773	mg/L	0.0002313	0.005773	mg/L	0.0002313	4.01%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	1.1	0.000028	mg/L	0.0000800	0.000028	mg/L	0.0000800	285.89%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	12.3	0.000092	mg/L	0.0000361	0.000092	mg/L	0.0000361	39.37%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	8.2	0.007667	mg/L	0.0002560	0.007667	mg/L	0.0002560	3.34%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	-0.9	-0.000248	mg/L	0.0009553	-0.000248	mg/L	0.0009553	385.31%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	4.7	0.000147	mg/L	0.0000898	0.000147	mg/L	0.0000898	61.04%
QC value within limits for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	11.9	0.000200	mg/L	0.0000992	0.000200	mg/L	0.0000992	49.54%
Co 228.616 At	2.6	0.000162	mg/L	0.0000603	0.000162	mg/L	0.0000603	37.19%
QC value within limits for Co 228.616 A Recovery = Not calculated								
Cr 267.716 At	-6.7	-0.000178	mg/L	0.0002392	-0.000178	mg/L	0.0002392	134.16%
QC value within limits for Cr 267.716 A Recovery = Not calculated								
Cu 324.752 At	-351.2	-0.002093	mg/L	0.0002115	-0.002093	mg/L	0.0002115	10.11%
QC value within limits for Cu 324.752 A Recovery = Not calculated								
Fe 273.955 Rt	-2.4	-0.004236	mg/L	0.0033689	-0.004236	mg/L	0.0033689	79.53%
QC value within limits for Fe 273.955 R Recovery = Not calculated								
Ga 417.206 At	12.0	0.000138	mg/L	0.0001316	0.000138	mg/L	0.0001316	95.05%
QC value within limits for Ga 417.206 A Recovery = Not calculated								
K 766.490 Rt	-13.7	-0.005512	mg/L	0.0041214	-0.005512	mg/L	0.0041214	74.77%
QC value within limits for K 766.490 R Recovery = Not calculated								
La 379.478 At	43.0	0.000201	mg/L	0.0000966	0.000201	mg/L	0.0000966	48.00%
QC value within limits for La 379.478 A Recovery = Not calculated								
Li 670.784 Rt	-22.5	-0.000209	mg/L	0.0001287	-0.000209	mg/L	0.0001287	61.66%
QC value within limits for Li 670.784 R Recovery = Not calculated								
Mg 279.077 Rt	1.3	0.002656	mg/L	0.0004588	0.002656	mg/L	0.0004588	17.27%
QC value within limits for Mg 279.077 R Recovery = Not calculated								
Mn 260.568 Rt	-0.1	-0.000004	mg/L	0.0000348	-0.000004	mg/L	0.0000348	893.72%
QC value within limits for Mn 260.568 R Recovery = Not calculated								
Mo 202.031 At	8.5	0.001074	mg/L	0.0000564	0.001074	mg/L	0.0000564	5.26%
QC value within limits for Mo 202.031 A Recovery = Not calculated								
Na 589.592 Rt	-460.5	-0.064988	mg/L	0.0002038	-0.064988	mg/L	0.0002038	0.31%
QC value within limits for Na 589.592 R Recovery = Not calculated								
Ni 232.003 At	2.1	0.000216	mg/L	0.0000466	0.000216	mg/L	0.0000466	21.52%
QC value within limits for Ni 232.003 A Recovery = Not calculated								
P 213.617 At	-1.0	-0.000595	mg/L	0.0010339	-0.000595	mg/L	0.0010339	173.63%
QC value within limits for P 213.617 A Recovery = Not calculated								
Pb 220.353 At	2.2	0.000626	mg/L	0.0018944	0.000626	mg/L	0.0018944	302.44%
QC value within limits for Pb 220.353 A Recovery = Not calculated								
Sb 206.836 At	1.2	0.000741	mg/L	0.0009248	0.000741	mg/L	0.0009248	124.87%
QC value within limits for Sb 206.836 A Recovery = Not calculated								
Sc 361.383 At	62.8	0.000052	mg/L	0.0000135	0.000052	mg/L	0.0000135	25.97%
QC value within limits for Sc 361.383 A Recovery = Not calculated								
Se 196.026 At	-1.5	-0.003448	mg/L	0.0005980	-0.003448	mg/L	0.0005980	17.34%
QC value within limits for Se 196.026 A Recovery = Not calculated								
Si 251.611 Rt	19.3	0.014385	mg/L	0.0022023	0.014385	mg/L	0.0022023	15.31%
QC value within limits for Si 251.611 R Recovery = Not calculated								
SIO2 251.611 Rt	19.3	0.030785	mg/L	0.0047127	0.030785	mg/L	0.0047127	15.31%

QC value within limits for SIO2 251.611 R Recovery = Not calculated

Sn 189.927 At	1.7	0.000718	mg/L	0.0014757	0.000718	mg/L	0.0014757 205.60%

QC value within limits for Sn 189.927 A Recovery = Not calculated

Sr 421.552 Rt	41.5	0.000058	mg/L	0.0000213	0.000058	mg/L	0.0000213 36.52%

QC value within limits for Sr 421.552 R Recovery = Not calculated

Ti 336.121 At	21.3	0.000074	mg/L	0.0000081	0.000074	mg/L	0.0000081 10.95%

QC value within limits for Ti 336.121 A Recovery = Not calculated

Tl 190.801 At	0.7	0.000955	mg/L	0.0011472	0.000955	mg/L	0.0011472 120.09%

QC value within limits for Tl 190.801 A Recovery = Not calculated

U 385.958 At	-10.7	-0.000608	mg/L	0.0011208	-0.000608	mg/L	0.0011208 184.24%
V 292.402 At	0.8	0.000018	mg/L	0.0000046	0.000018	mg/L	0.0000046 25.49%

QC value within limits for V 292.402 A Recovery = Not calculated

Zn 206.200 At	-1.7	-0.000190	mg/L	0.0000402	-0.000190	mg/L	0.0000402 21.14%

QC value within limits for Zn 206.200 A Recovery = Not calculated

All analyte(s) passed QC.

Sequence No.: 13
Sample ID: W9D0297-07
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 48
Date Collected: 4/27/2009 12:55:26 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0297-07

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	124862.3	99.8066	%	0.21945				0.22%
Lu 261.542 A	2315922.6	97.4790	%	0.60365				0.62%
Ag 328.068 At	100.7	0.000843	mg/L	0.0001765	0.000843	mg/L	0.0001765	20.94%
Al 308.215 Rt	5007.8	4.15438	mg/L	0.008728	4.15438	mg/L	0.008728	0.21%
As 188.979 At	144.0	0.179221	mg/L	0.0000582	0.179221	mg/L	0.0000582	0.03%
B 249.677 Rt	79.1	0.042507	mg/L	0.0005608	0.042507	mg/L	0.0005608	1.32%
Ba 233.527 At	1563.1	0.039389	mg/L	0.0001988	0.039389	mg/L	0.0001988	0.50%
Be 313.107 Rt	18.6	0.000134	mg/L	0.0000064	0.000134	mg/L	0.0000064	4.76%
Bi 222.821 At	8.1	0.016416	mg/L	0.0003218	0.016416	mg/L	0.0003218	1.96%
Ca 315.887 Rt	65442.8	18.8612	mg/L	0.08624	18.8612	mg/L	0.08624	0.46%
Cd 226.502 At	25.9	0.000358	mg/L	0.0000170	0.000358	mg/L	0.0000170	4.74%
Ce 418.660 At	380.6	0.006265	mg/L	0.0006483	0.006265	mg/L	0.0006483	10.35%
Co 228.616 At	5.2	0.000130	mg/L	0.0002387	0.000130	mg/L	0.0002387	183.18%
Cr 267.716 At	168.0	0.004414	mg/L	0.0001607	0.004414	mg/L	0.0001607	3.64%
Cu 324.752 At	58650.9	0.349453	mg/L	0.0040854	0.349453	mg/L	0.0040854	1.17%
Fe 273.955 Rt	1261.6	2.22811	mg/L	0.017758	2.22811	mg/L	0.017758	0.80%
Ga 417.206 At	152.9	0.000907	mg/L	0.0000873	0.000907	mg/L	0.0000873	9.62%
K 766.490 Rt	12014.4	4.84441	mg/L	0.017834	4.84441	mg/L	0.017834	0.37%
La 379.478 At	757.2	0.003170	mg/L	0.0000247	0.003170	mg/L	0.0000247	0.78%
Li 670.784 Rt	262.1	0.002430	mg/L	0.0000040	0.002430	mg/L	0.0000040	0.17%
Mg 279.077 Rt	1284.4	2.60641	mg/L	0.000817	2.60641	mg/L	0.000817	0.03%
Mn 260.568 Rt	4977.7	0.385137	mg/L	0.0030973	0.385137	mg/L	0.0030973	0.80%
Mo 202.031 At	38.2	0.004590	mg/L	0.0004522	0.004590	mg/L	0.0004522	9.85%
Na 589.592 Rt	14152.4	1.99743	mg/L	0.020522	1.99743	mg/L	0.020522	1.03%
Ni 232.003 At	-32.8	0.000863	mg/L	0.0003000	0.000863	mg/L	0.0003000	34.77%
P 213.617 At	787.8	0.506263	mg/L	0.0082050	0.506263	mg/L	0.0082050	1.62%
Pb 220.353 At	194.7	0.056325	mg/L	0.0022235	0.056325	mg/L	0.0022235	3.95%
Sb 206.836 At	12.0	0.007359	mg/L	0.0010398	0.007359	mg/L	0.0010398	14.13%
Sc 361.383 At	773.5	0.000626	mg/L	0.0000048	0.000626	mg/L	0.0000048	0.77%
Se 196.026 At	-3.7	-0.008664	mg/L	0.0096655	-0.008664	mg/L	0.0096655	111.55%
Si 251.611 Rt	12593.9	9.39869	mg/L	0.030061	9.39869	mg/L	0.030061	0.32%
SIO2 251.611 Rt	12593.9	20.1132	mg/L	0.06433	20.1132	mg/L	0.06433	0.32%
Sn 189.927 At	-10.5	-0.003876	mg/L	0.0004525	-0.003876	mg/L	0.0004525	11.68%
Sr 421.552 Rt	18269.3	0.025409	mg/L	0.0000494	0.025409	mg/L	0.0000494	0.19%
Ti 336.121 At	14461.0	0.057334	mg/L	0.0005669	0.057334	mg/L	0.0005669	0.99%
Tl 190.801 At	-0.7	0.000253	mg/L	0.0008937	0.000253	mg/L	0.0008937	353.93%
U 385.958 At	123.1	0.000639	mg/L	0.0001662	0.000639	mg/L	0.0001662	26.03%
V 292.402 At	566.2	0.006871	mg/L	0.0000497	0.006871	mg/L	0.0000497	0.72%
Zn 206.200 At	779.7	0.088056	mg/L	0.0006560	0.088056	mg/L	0.0006560	0.74%

Sequence No.: 14
Sample ID: W9D0297-08
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 49
Date Collected: 4/27/2009 1:01:13 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0297-08

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	124093.5	99.1920	%	1.18993				1.20%
Lu 261.542 A	2342251.5	98.5872	%	0.07514				0.08%
Ag 328.068 At	188.8	0.001563	mg/L	0.0001264	0.001563	mg/L	0.0001264	8.09%
Al 308.215 Rt	7018.3	5.82261	mg/L	0.013374	5.82261	mg/L	0.013374	0.23%
As 188.979 At	200.1	0.248973	mg/L	0.0013766	0.248973	mg/L	0.0013766	0.55%
B 249.677 Rt	69.5	0.037389	mg/L	0.0003123	0.037389	mg/L	0.0003123	0.84%
Ba 233.527 At	1555.7	0.039168	mg/L	0.0000029	0.039168	mg/L	0.0000029	0.01%
Be 313.107 Rt	25.7	0.000185	mg/L	0.0000280	0.000185	mg/L	0.0000280	15.11%
Bi 222.821 At	11.4	0.022687	mg/L	0.0044220	0.022687	mg/L	0.0044220	19.49%
Ca 315.887 Rt	52035.3	14.9970	mg/L	0.00458	14.9970	mg/L	0.00458	0.03%
Cd 226.502 At	51.5	0.000945	mg/L	0.0001138	0.000945	mg/L	0.0001138	12.03%
Ce 418.660 At	407.4	0.006702	mg/L	0.0001089	0.006702	mg/L	0.0001089	1.62%
Co 228.616 At	6.9	0.000188	mg/L	0.0000990	0.000188	mg/L	0.0000990	52.63%
Cr 267.716 At	248.5	0.006541	mg/L	0.0000680	0.006541	mg/L	0.0000680	1.04%
Cu 324.752 At	86400.8	0.514784	mg/L	0.0042288	0.514784	mg/L	0.0042288	0.82%
Fe 273.955 Rt	1865.3	3.29438	mg/L	0.020163	3.29438	mg/L	0.020163	0.61%
Ga 417.206 At	216.2	0.001364	mg/L	0.0000783	0.001364	mg/L	0.0000783	5.74%
K 766.490 Rt	9706.2	3.91374	mg/L	0.002626	3.91374	mg/L	0.002626	0.07%
La 379.478 At	1026.9	0.004282	mg/L	0.0000391	0.004282	mg/L	0.0000391	0.91%
Li 670.784 Rt	319.8	0.002965	mg/L	0.0000347	0.002965	mg/L	0.0000347	1.17%
Mg 279.077 Rt	1343.2	2.72540	mg/L	0.018743	2.72540	mg/L	0.018743	0.69%
Mn 260.568 Rt	4060.8	0.314089	mg/L	0.0028173	0.314089	mg/L	0.0028173	0.90%
Mo 202.031 At	33.4	0.004052	mg/L	0.0004140	0.004052	mg/L	0.0004140	10.22%
Na 589.592 Rt	14818.8	2.09150	mg/L	0.018971	2.09150	mg/L	0.018971	0.91%
Ni 232.003 At	-32.5	0.002028	mg/L	0.0002988	0.002028	mg/L	0.0002988	14.73%
P 213.617 At	1296.2	0.834523	mg/L	0.0006067	0.834523	mg/L	0.0006067	0.07%
Pb 220.353 At	298.9	0.086221	mg/L	0.0014764	0.086221	mg/L	0.0014764	1.71%
Sb 206.836 At	18.8	0.011531	mg/L	0.0028672	0.011531	mg/L	0.0028672	24.87%
Sc 361.383 At	1174.6	0.000961	mg/L	0.0000154	0.000961	mg/L	0.0000154	1.60%
Se 196.026 At	-4.2	-0.009642	mg/L	0.0041642	-0.009642	mg/L	0.0041642	43.19%
Si 251.611 Rt	16810.6	12.5458	mg/L	0.03527	12.5458	mg/L	0.03527	0.28%
SIO2 251.611 Rt	16810.6	26.8480	mg/L	0.07547	26.8480	mg/L	0.07547	0.28%
Sn 189.927 At	-8.7	-0.003236	mg/L	0.0008984	-0.003236	mg/L	0.0008984	27.76%
Sr 421.552 Rt	15344.0	0.021351	mg/L	0.0000403	0.021351	mg/L	0.0000403	0.19%
Ti 336.121 At	18086.6	0.071736	mg/L	0.0003350	0.071736	mg/L	0.0003350	0.47%
Tl 190.801 At	-0.3	0.000575	mg/L	0.0004213	0.000575	mg/L	0.0004213	73.22%
U 385.958 At	176.5	0.000990	mg/L	0.0004228	0.000990	mg/L	0.0004228	42.71%
V 292.402 At	838.3	0.010131	mg/L	0.0000349	0.010131	mg/L	0.0000349	0.34%
Zn 206.200 At	1540.2	0.174257	mg/L	0.0005504	0.174257	mg/L	0.0005504	0.32%

Sequence No.: 15
Sample ID: W9D0297-09
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 50
Date Collected: 4/27/2009 1:06:59 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0297-09

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	123112.8	98.4081	%	0.18239				0.19%
Lu 261.542 A	2315492.7	97.4609	%	0.11998				0.12%
Ag 328.068 At	117.2	0.001139	mg/L	0.0000246	0.001139	mg/L	0.0000246	2.16%
Al 308.215 Rt	11982.7	9.94183	mg/L	0.015421	9.94183	mg/L	0.015421	0.16%
As 188.979 At	610.8	0.760193	mg/L	0.0043929	0.760193	mg/L	0.0043929	0.58%
B 249.677 Rt	94.5	0.050835	mg/L	0.0000252	0.050835	mg/L	0.0000252	0.05%
Ba 233.527 At	1949.6	0.049057	mg/L	0.0000966	0.049057	mg/L	0.0000966	0.20%
Be 313.107 Rt	51.5	0.000374	mg/L	0.0000239	0.000374	mg/L	0.0000239	6.39%
Bi 222.821 At	5.7	0.022218	mg/L	0.0007773	0.022218	mg/L	0.0007773	3.50%
Ca 315.887 Rt	61755.6	17.7985	mg/L	0.01974	17.7985	mg/L	0.01974	0.11%
Cd 226.502 At	41.0	0.000267	mg/L	0.0000645	0.000267	mg/L	0.0000645	24.16%
Ce 418.660 At	505.0	0.008318	mg/L	0.0004296	0.008318	mg/L	0.0004296	5.16%
Co 228.616 At	8.5	0.000139	mg/L	0.0001151	0.000139	mg/L	0.0001151	82.60%
Cr 267.716 At	346.6	0.009153	mg/L	0.0000253	0.009153	mg/L	0.0000253	0.28%
Cu 324.752 At	45784.2	0.272829	mg/L	0.0003050	0.272829	mg/L	0.0003050	0.11%
Fe 273.955 Rt	2858.3	5.04831	mg/L	0.017613	5.04831	mg/L	0.017613	0.35%
Ga 417.206 At	344.3	0.002206	mg/L	0.0001213	0.002206	mg/L	0.0001213	5.50%
K 766.490 Rt	15218.0	6.13619	mg/L	0.024829	6.13619	mg/L	0.024829	0.40%
La 379.478 At	1031.9	0.004029	mg/L	0.0000043	0.004029	mg/L	0.0000043	0.11%
Li 670.784 Rt	495.0	0.004590	mg/L	0.0002675	0.004590	mg/L	0.0002675	5.83%
Mg 279.077 Rt	1815.6	3.68334	mg/L	0.001235	3.68334	mg/L	0.001235	0.03%
Mn 260.568 Rt	4461.3	0.344959	mg/L	0.0012682	0.344959	mg/L	0.0012682	0.37%
Mo 202.031 At	27.1	0.003227	mg/L	0.0000881	0.003227	mg/L	0.0000881	2.73%
Na 589.592 Rt	16162.5	2.28114	mg/L	0.001409	2.28114	mg/L	0.001409	0.06%
Ni 232.003 At	-50.5	0.002686	mg/L	0.0003633	0.002686	mg/L	0.0003633	13.52%
P 213.617 At	564.6	0.365180	mg/L	0.0031793	0.365180	mg/L	0.0031793	0.87%
Pb 220.353 At	183.6	0.054416	mg/L	0.0011275	0.054416	mg/L	0.0011275	2.07%
Sb 206.836 At	37.4	0.022904	mg/L	0.0028358	0.022904	mg/L	0.0028358	12.38%
Sc 361.383 At	2215.0	0.001822	mg/L	0.0000003	0.001822	mg/L	0.0000003	0.02%
Se 196.026 At	-0.3	-0.000685	mg/L	0.0005413	-0.000685	mg/L	0.0005413	79.07%
Si 251.611 Rt	28030.3	20.9186	mg/L	0.00320	20.9186	mg/L	0.00320	0.02%
SIO2 251.611 Rt	28030.3	44.7658	mg/L	0.00686	44.7658	mg/L	0.00686	0.02%
Sn 189.927 At	-11.6	-0.004374	mg/L	0.0010435	-0.004374	mg/L	0.0010435	23.85%
Sr 421.552 Rt	16587.5	0.023062	mg/L	0.0000601	0.023062	mg/L	0.0000601	0.26%
Ti 336.121 At	31295.9	0.124156	mg/L	0.0001477	0.124156	mg/L	0.0001477	0.12%
Tl 190.801 At	-1.9	-0.001470	mg/L	0.0002561	-0.001470	mg/L	0.0002561	17.43%
U 385.958 At	250.5	0.000480	mg/L	0.0011605	0.000480	mg/L	0.0011605	241.83%
V 292.402 At	1556.1	0.018813	mg/L	0.0000303	0.018813	mg/L	0.0000303	0.16%
Zn 206.200 At	1336.5	0.151103	mg/L	0.0003074	0.151103	mg/L	0.0003074	0.20%

Sequence No.: 16
Sample ID: W9D0297-10
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 51
Date Collected: 4/27/2009 1:12:45 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0297-10

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	120670.3	96.4557	%	0.59833				0.62%
Lu 261.542 A	2317933.7	97.5637	%	0.39187				0.40%
Ag 328.068 At	209.8	0.001818	mg/L	0.0001485	0.001818	mg/L	0.0001485	8.17%
Al 308.215 Rt	10251.6	8.50541	mg/L	0.013213	8.50541	mg/L	0.013213	0.16%
As 188.979 At	83.1	0.103575	mg/L	0.0002816	0.103575	mg/L	0.0002816	0.27%
B 249.677 Rt	55.5	0.029955	mg/L	0.0001008	0.029955	mg/L	0.0001008	0.34%
Ba 233.527 At	2099.7	0.052848	mg/L	0.0002610	0.052848	mg/L	0.0002610	0.49%
Be 313.107 Rt	46.9	0.000340	mg/L	0.0000689	0.000340	mg/L	0.0000689	20.24%
Bi 222.821 At	15.7	0.025970	mg/L	0.0017424	0.025970	mg/L	0.0017424	6.71%
Ca 315.887 Rt	76013.9	21.9080	mg/L	0.01118	21.9080	mg/L	0.01118	0.05%
Cd 226.502 At	63.4	0.000981	mg/L	0.0000947	0.000981	mg/L	0.0000947	9.66%
Ce 418.660 At	530.5	0.008727	mg/L	0.0003838	0.008727	mg/L	0.0003838	4.40%
Co 228.616 At	21.0	0.000938	mg/L	0.0002531	0.000938	mg/L	0.0002531	26.99%
Cr 267.716 At	332.5	0.008771	mg/L	0.0002307	0.008771	mg/L	0.0002307	2.63%
Cu 324.752 At	99170.8	0.590884	mg/L	0.0047460	0.590884	mg/L	0.0047460	0.80%
Fe 273.955 Rt	2809.6	4.96217	mg/L	0.035252	4.96217	mg/L	0.035252	0.71%
Ga 417.206 At	309.7	0.001871	mg/L	0.0001831	0.001871	mg/L	0.0001831	9.79%
K 766.490 Rt	16030.7	6.46387	mg/L	0.043513	6.46387	mg/L	0.043513	0.67%
La 379.478 At	1047.5	0.004120	mg/L	0.0000171	0.004120	mg/L	0.0000171	0.42%
Li 670.784 Rt	196.9	0.001826	mg/L	0.0000140	0.001826	mg/L	0.0000140	0.77%
Mg 279.077 Rt	1937.7	3.93150	mg/L	0.009100	3.93150	mg/L	0.009100	0.23%
Mn 260.568 Rt	4231.2	0.327141	mg/L	0.0005784	0.327141	mg/L	0.0005784	0.18%
Mo 202.031 At	22.1	0.002527	mg/L	0.0005785	0.002527	mg/L	0.0005785	22.90%
Na 589.592 Rt	17581.7	2.48144	mg/L	0.010868	2.48144	mg/L	0.010868	0.44%
Ni 232.003 At	-42.7	0.002575	mg/L	0.0007575	0.002575	mg/L	0.0007575	29.42%
P 213.617 At	848.0	0.539857	mg/L	0.0000290	0.539857	mg/L	0.0000290	0.01%
Pb 220.353 At	286.9	0.082920	mg/L	0.0002649	0.082920	mg/L	0.0002649	0.32%
Sb 206.836 At	11.2	0.006891	mg/L	0.0006923	0.006891	mg/L	0.0006923	10.05%
Sc 361.383 At	2055.1	0.001690	mg/L	0.0000178	0.001690	mg/L	0.0000178	1.05%
Se 196.026 At	-1.4	-0.003258	mg/L	0.0067273	-0.003258	mg/L	0.0067273	206.46%
Si 251.611 Rt	17422.8	13.0022	mg/L	0.17224	13.0022	mg/L	0.17224	1.32%
SIO2 251.611 Rt	17422.8	27.8248	mg/L	0.36860	27.8248	mg/L	0.36860	1.32%
Sn 189.927 At	-10.7	-0.003896	mg/L	0.0009594	-0.003896	mg/L	0.0009594	24.63%
Sr 421.552 Rt	18250.6	0.025346	mg/L	0.0000946	0.025346	mg/L	0.0000946	0.37%
Ti 336.121 At	28293.7	0.112193	mg/L	0.0008857	0.112193	mg/L	0.0008857	0.79%
Tl 190.801 At	-0.6	0.000266	mg/L	0.0007267	0.000266	mg/L	0.0007267	272.88%
U 385.958 At	257.8	0.001022	mg/L	0.0019097	0.001022	mg/L	0.0019097	186.93%
V 292.402 At	1042.4	0.012496	mg/L	0.0000198	0.012496	mg/L	0.0000198	0.16%
Zn 206.200 At	1403.6	0.158704	mg/L	0.0002547	0.158704	mg/L	0.0002547	0.16%

Sequence No.: 17
Sample ID: W9D0297-11
Analyst: DT
Initial Sample Wt:
Dilution:

Autosampler Location: 52
Date Collected: 4/27/2009 1:18:31 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0297-11

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	123314.0	98.5689	%	0.03959				0.04%
Lu 261.542 A	2321776.0	97.7254	%	0.24364				0.25%
Ag 328.068 At	124.9	0.000998	mg/L	0.0002031	0.000998	mg/L	0.0002031	20.34%
Al 308.215 Rt	6064.1	5.03028	mg/L	0.009294	5.03028	mg/L	0.009294	0.18%
As 188.979 At	95.0	0.118216	mg/L	0.0003335	0.118216	mg/L	0.0003335	0.28%
B 249.677 Rt	54.4	0.029248	mg/L	0.0003009	0.029248	mg/L	0.0003009	1.03%
Ba 233.527 At	2403.1	0.060576	mg/L	0.0000678	0.060576	mg/L	0.0000678	0.11%
Be 313.107 Rt	23.8	0.000172	mg/L	0.0000351	0.000172	mg/L	0.0000351	20.40%
Bi 222.821 At	6.5	0.014414	mg/L	0.0028298	0.014414	mg/L	0.0028298	19.63%
Ca 315.887 Rt	62786.1	18.0955	mg/L	0.02157	18.0955	mg/L	0.02157	0.12%
Cd 226.502 At	38.9	0.000649	mg/L	0.0002502	0.000649	mg/L	0.0002502	38.57%
Ce 418.660 At	486.5	0.007999	mg/L	0.0000654	0.007999	mg/L	0.0000654	0.82%
Co 228.616 At	14.1	0.000612	mg/L	0.0000495	0.000612	mg/L	0.0000495	8.09%
Cr 267.716 At	187.7	0.004918	mg/L	0.0000384	0.004918	mg/L	0.0000384	0.78%
Cu 324.752 At	57224.8	0.340960	mg/L	0.0015851	0.340960	mg/L	0.0015851	0.46%
Fe 273.955 Rt	1586.9	2.80279	mg/L	0.024545	2.80279	mg/L	0.024545	0.88%
Ga 417.206 At	169.4	0.000899	mg/L	0.0000773	0.000899	mg/L	0.0000773	8.60%
K 766.490 Rt	11678.0	4.70879	mg/L	0.010539	4.70879	mg/L	0.010539	0.22%
La 379.478 At	880.0	0.003659	mg/L	0.0001472	0.003659	mg/L	0.0001472	4.02%
Li 670.784 Rt	279.2	0.002589	mg/L	0.0000545	0.002589	mg/L	0.0000545	2.11%
Mg 279.077 Rt	1488.4	3.02107	mg/L	0.005277	3.02107	mg/L	0.005277	0.17%
Mn 260.568 Rt	11342.9	0.877865	mg/L	0.0000270	0.877865	mg/L	0.0000270	0.00%
Mo 202.031 At	34.8	0.004172	mg/L	0.0000231	0.004172	mg/L	0.0000231	0.55%
Na 589.592 Rt	14122.5	1.99322	mg/L	0.006390	1.99322	mg/L	0.006390	0.32%
Ni 232.003 At	-34.4	0.002642	mg/L	0.0002443	0.002642	mg/L	0.0002443	9.25%
P 213.617 At	591.1	0.378264	mg/L	0.0043550	0.378264	mg/L	0.0043550	1.15%
Pb 220.353 At	296.0	0.085197	mg/L	0.0001056	0.085197	mg/L	0.0001056	0.12%
Sb 206.836 At	9.7	0.005929	mg/L	0.0017270	0.005929	mg/L	0.0017270	29.13%
Sc 361.383 At	924.6	0.000732	mg/L	0.0000030	0.000732	mg/L	0.0000030	0.41%
Se 196.026 At	-4.2	-0.010353	mg/L	0.0072935	-0.010353	mg/L	0.0072935	70.45%
Si 251.611 Rt	12747.7	9.51342	mg/L	0.012853	9.51342	mg/L	0.012853	0.14%
SIO2 251.611 Rt	12747.7	20.3587	mg/L	0.02750	20.3587	mg/L	0.02750	0.14%
Sn 189.927 At	-10.8	-0.004030	mg/L	0.0008620	-0.004030	mg/L	0.0008620	21.39%
Sr 421.552 Rt	18293.2	0.025452	mg/L	0.0000133	0.025452	mg/L	0.0000133	0.05%
Ti 336.121 At	16817.5	0.066701	mg/L	0.0002821	0.066701	mg/L	0.0002821	0.42%
Tl 190.801 At	0.2	0.002824	mg/L	0.0004967	0.002824	mg/L	0.0004967	17.59%
U 385.958 At	165.3	0.001566	mg/L	0.0002631	0.001566	mg/L	0.0002631	16.80%
V 292.402 At	558.2	0.006771	mg/L	0.0001245	0.006771	mg/L	0.0001245	1.84%
Zn 206.200 At	1166.5	0.131722	mg/L	0.0000116	0.131722	mg/L	0.0000116	0.01%

Sequence No.: 18
Sample ID: CCV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 6
Date Collected: 4/27/2009 1:24:18 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCV

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	123069.6	98.3736	%	0.23477				0.24%
Lu 261.542 A	2336424.9	98.3420	%	0.50178				0.51%
Ag 328.068 At	271449.6	1.99874	mg/L	0.017772	1.99874	mg/L	0.017772	0.89%
QC value within limits for Ag 328.068 A Recovery = 99.94%								
Al 308.215 Rt	2605.0	2.06369	mg/L	0.006845	2.06369	mg/L	0.006845	0.33%
QC value within limits for Al 308.215 R Recovery = 103.18%								
As 188.979 At	1706.2	1.99541	mg/L	0.011775	1.99541	mg/L	0.011775	0.59%
QC value within limits for As 188.979 A Recovery = 99.77%								
B 249.677 Rt	3768.7	2.02124	mg/L	0.008435	2.02124	mg/L	0.008435	0.42%
QC value within limits for B 249.677 R Recovery = 101.06%								
Ba 233.527 At	79667.1	2.01120	mg/L	0.013413	2.01120	mg/L	0.013413	0.67%
QC value within limits for Ba 233.527 A Recovery = 100.56%								
Be 313.107 Rt	262574.1	1.96635	mg/L	0.002862	1.96635	mg/L	0.002862	0.15%
QC value within limits for Be 313.107 R Recovery = 98.32%								
Bi 222.821 At	4128.9	3.71316	mg/L	0.027542	3.71316	mg/L	0.027542	0.74%
QC value within limits for Bi 222.821 A Recovery = 92.83%								
Ca 315.887 Rt	7005.3	2.00779	mg/L	0.011471	2.00779	mg/L	0.011471	0.57%
QC value within limits for Ca 315.887 R Recovery = 100.39%								
Cd 226.502 At	64223.0	1.99249	mg/L	0.011563	1.99249	mg/L	0.011563	0.58%
QC value within limits for Cd 226.502 A Recovery = 99.62%								
Ce 418.660 At	-424.6	-0.002803	mg/L	0.0002649	-0.002803	mg/L	0.0002649	9.45%
QC value within limits for Ce 418.660 A Recovery = Not calculated								
Co 228.616 At	32485.5	1.98947	mg/L	0.015517	1.98947	mg/L	0.015517	0.78%
QC value within limits for Co 228.616 A Recovery = 99.47%								
Cr 267.716 At	75227.5	2.00019	mg/L	0.014900	2.00019	mg/L	0.014900	0.74%
QC value within limits for Cr 267.716 A Recovery = 100.01%								
Cu 324.752 At	331869.4	1.97756	mg/L	0.001786	1.97756	mg/L	0.001786	0.09%
QC value within limits for Cu 324.752 A Recovery = 98.88%								
Fe 273.955 Rt	1164.7	2.04074	mg/L	0.011545	2.04074	mg/L	0.011545	0.57%
QC value within limits for Fe 273.955 R Recovery = 102.04%								
Ga 417.206 At	316954.0	3.74970	mg/L	0.010572	3.74970	mg/L	0.010572	0.28%
QC value within limits for Ga 417.206 A Recovery = 93.74%								
K 766.490 Rt	49192.5	19.8351	mg/L	0.02120	19.8351	mg/L	0.02120	0.11%
QC value within limits for K 766.490 R Recovery = 99.18%								
La 379.478 At	846371.2	3.96524	mg/L	0.005695	3.96524	mg/L	0.005695	0.14%
QC value within limits for La 379.478 A Recovery = 99.13%								
Li 670.784 Rt	419707.1	3.89139	mg/L	0.008047	3.89139	mg/L	0.008047	0.21%
QC value within limits for Li 670.784 R Recovery = 97.28%								
Mg 279.077 Rt	1007.7	2.05820	mg/L	0.007897	2.05820	mg/L	0.007897	0.38%
QC value within limits for Mg 279.077 R Recovery = 102.91%								
Mn 260.568 Rt	25464.8	1.97017	mg/L	0.010344	1.97017	mg/L	0.010344	0.53%
QC value within limits for Mn 260.568 R Recovery = 98.51%								
Mo 202.031 At	15792.6	2.00419	mg/L	0.016786	2.00419	mg/L	0.016786	0.84%
QC value within limits for Mo 202.031 A Recovery = 100.21%								
Na 589.592 Rt	143959.6	20.3182	mg/L	0.12010	20.3182	mg/L	0.12010	0.59%
QC value within limits for Na 589.592 R Recovery = 101.59%								
Ni 232.003 At	19799.2	1.97559	mg/L	0.020692	1.97559	mg/L	0.020692	1.05%
QC value within limits for Ni 232.003 A Recovery = 98.78%								
P 213.617 At	13827.2	9.02424	mg/L	0.051439	9.02424	mg/L	0.051439	0.57%
QC value within limits for P 213.617 A Recovery = 90.24%								
Pb 220.353 At	7001.2	1.99815	mg/L	0.011083	1.99815	mg/L	0.011083	0.55%
QC value within limits for Pb 220.353 A Recovery = 99.91%								
Sb 206.836 At	3229.3	1.98397	mg/L	0.013557	1.98397	mg/L	0.013557	0.68%
QC value within limits for Sb 206.836 A Recovery = 99.20%								
Sc 361.383 At	1188809.5	0.986644	mg/L	0.0011387	0.986644	mg/L	0.0011387	0.12%
QC value within limits for Sc 361.383 A Recovery = 98.66%								
Se 196.026 At	840.3	1.94654	mg/L	0.016924	1.94654	mg/L	0.016924	0.87%
QC value within limits for Se 196.026 A Recovery = 97.33%								
Si 251.611 Rt	13696.0	10.1078	mg/L	0.05611	10.1078	mg/L	0.05611	0.56%
QC value within limits for Si 251.611 R Recovery = 101.08%								

SIO2 251.611 R†	13696.0	21.6322	mg/L	0.12006	21.6322	mg/L	0.12006	0.55%
QC value within limits for SIO2 251.611 R Recovery = 101.08%								
Sn 189.927 A†	9492.2	3.90657	mg/L	0.010124	3.90657	mg/L	0.010124	0.26%
QC value within limits for Sn 189.927 A Recovery = 97.66%								
Sr 421.552 R†	1387694.8	1.94763	mg/L	0.000092	1.94763	mg/L	0.000092	0.00%
QC value within limits for Sr 421.552 R Recovery = 97.38%								
Ti 336.121 A†	552006.8	1.98935	mg/L	0.002647	1.98935	mg/L	0.002647	0.13%
QC value within limits for Ti 336.121 A Recovery = 99.47%								
Tl 190.801 A†	1472.1	1.98331	mg/L	0.011319	1.98331	mg/L	0.011319	0.57%
QC value within limits for Tl 190.801 A Recovery = 99.17%								
U 385.958 A†	19158.5	1.00301	mg/L	0.009174	1.00301	mg/L	0.009174	0.91%
V 292.402 A†	163138.8	2.02993	mg/L	0.016881	2.02993	mg/L	0.016881	0.83%
QC value within limits for V 292.402 A Recovery = 101.50%								
Zn 206.200 A†	17683.3	1.99819	mg/L	0.009007	1.99819	mg/L	0.009007	0.45%
QC value within limits for Zn 206.200 A Recovery = 99.91%								

All analyte(s) passed QC.

Sequence No.: 19
Sample ID: CCB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 1
Date Collected: 4/27/2009 1:30:19 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCB

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	122635.8	98.0269	%	0.66564				0.68%
Lu 261.542 A	2369819.7	99.7476	%	0.00656				0.01%
Ag 328.068 At	-2.8	-0.000019	mg/L	0.0000983	-0.000019	mg/L	0.0000983	515.45%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	4.5	0.003744	mg/L	0.0021554	0.003744	mg/L	0.0021554	57.57%
QC value within limits for Al 308.215 R Recovery = Not calculated								
As 188.979 At	0.1	0.000120	mg/L	0.0017567	0.000120	mg/L	0.0017567	>999.9%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	7.6	0.004053	mg/L	0.0009127	0.004053	mg/L	0.0009127	22.52%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	5.0	0.000126	mg/L	0.0000375	0.000126	mg/L	0.0000375	29.88%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	15.4	0.000115	mg/L	0.0000062	0.000115	mg/L	0.0000062	5.40%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	6.1	0.005712	mg/L	0.0013435	0.005712	mg/L	0.0013435	23.52%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	-4.5	-0.001294	mg/L	0.0003374	-0.001294	mg/L	0.0003374	26.07%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	9.0	0.000280	mg/L	0.0000836	0.000280	mg/L	0.0000836	29.89%
QC value within limits for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	12.6	0.000214	mg/L	0.0001233	0.000214	mg/L	0.0001233	57.56%
Co 228.616 At	3.2	0.000197	mg/L	0.0001965	0.000197	mg/L	0.0001965	99.63%
QC value within limits for Co 228.616 A Recovery = Not calculated								
Cr 267.716 At	-3.7	-0.000098	mg/L	0.0000922	-0.000098	mg/L	0.0000922	93.91%
QC value within limits for Cr 267.716 A Recovery = Not calculated								
Cu 324.752 At	-357.0	-0.002127	mg/L	0.0000393	-0.002127	mg/L	0.0000393	1.85%
QC value within limits for Cu 324.752 A Recovery = Not calculated								
Fe 273.955 Rt	-2.1	-0.003711	mg/L	0.0037986	-0.003711	mg/L	0.0037986	102.35%
QC value within limits for Fe 273.955 R Recovery = Not calculated								
Ga 417.206 At	24.4	0.000286	mg/L	0.0001773	0.000286	mg/L	0.0001773	62.11%
QC value within limits for Ga 417.206 A Recovery = Not calculated								
K 766.490 Rt	-24.8	-0.010006	mg/L	0.0015891	-0.010006	mg/L	0.0015891	15.88%
QC value within limits for K 766.490 R Recovery = Not calculated								
La 379.478 At	34.3	0.000160	mg/L	0.0000276	0.000160	mg/L	0.0000276	17.27%
QC value within limits for La 379.478 A Recovery = Not calculated								
Li 670.784 Rt	-25.9	-0.000240	mg/L	0.0000337	-0.000240	mg/L	0.0000337	14.02%
QC value within limits for Li 670.784 R Recovery = Not calculated								
Mg 279.077 Rt	-0.3	-0.000623	mg/L	0.0011539	-0.000623	mg/L	0.0011539	185.33%
QC value within limits for Mg 279.077 R Recovery = Not calculated								
Mn 260.568 Rt	0.1	0.000004	mg/L	0.0000631	0.000004	mg/L	0.0000631	>999.9%
QC value within limits for Mn 260.568 R Recovery = Not calculated								
Mo 202.031 At	11.6	0.001466	mg/L	0.0004868	0.001466	mg/L	0.0004868	33.20%
QC value within limits for Mo 202.031 A Recovery = Not calculated								
Na 589.592 Rt	-477.3	-0.067365	mg/L	0.0001421	-0.067365	mg/L	0.0001421	0.21%
QC value within limits for Na 589.592 R Recovery = Not calculated								
Ni 232.003 At	4.4	0.000447	mg/L	0.0000722	0.000447	mg/L	0.0000722	16.15%
QC value within limits for Ni 232.003 A Recovery = Not calculated								
P 213.617 At	4.0	0.002663	mg/L	0.0009809	0.002663	mg/L	0.0009809	36.83%
QC value within limits for P 213.617 A Recovery = Not calculated								
Pb 220.353 At	-2.0	-0.000552	mg/L	0.0001531	-0.000552	mg/L	0.0001531	27.71%
QC value within limits for Pb 220.353 A Recovery = Not calculated								
Sb 206.836 At	1.7	0.001028	mg/L	0.0002522	0.001028	mg/L	0.0002522	24.54%
QC value within limits for Sb 206.836 A Recovery = Not calculated								
Sc 361.383 At	97.1	0.000081	mg/L	0.0000112	0.000081	mg/L	0.0000112	13.94%
QC value within limits for Sc 361.383 A Recovery = Not calculated								
Se 196.026 At	0.1	0.000227	mg/L	0.0005528	0.000227	mg/L	0.0005528	243.98%
QC value within limits for Se 196.026 A Recovery = Not calculated								
Si 251.611 Rt	36.1	0.026928	mg/L	0.0006245	0.026928	mg/L	0.0006245	2.32%
QC value within limits for Si 251.611 R Recovery = Not calculated								
SIO2 251.611 Rt	36.1	0.057628	mg/L	0.0013359	0.057628	mg/L	0.0013359	2.32%

QC value within limits for SIO2 251.611 R Recovery = Not calculated							
Sn 189.927 A†	2.0	0.000810	mg/L	0.0007908	0.000810	mg/L	0.0007908 97.59%
QC value within limits for Sn 189.927 A Recovery = Not calculated							
Sr 421.552 R†	37.4	0.000053	mg/L	0.0000019	0.000053	mg/L	0.0000019 3.64%
QC value within limits for Sr 421.552 R Recovery = Not calculated							
Ti 336.121 A†	38.3	0.000135	mg/L	0.0000365	0.000135	mg/L	0.0000365 26.96%
QC value within limits for Ti 336.121 A Recovery = Not calculated							
Tl 190.801 A†	1.0	0.001321	mg/L	0.0003627	0.001321	mg/L	0.0003627 27.46%
QC value within limits for Tl 190.801 A Recovery = Not calculated							
U 385.958 A†	-25.0	-0.001441	mg/L	0.0005260	-0.001441	mg/L	0.0005260 36.49%
V 292.402 A†	-4.3	-0.000043	mg/L	0.0000380	-0.000043	mg/L	0.0000380 88.92%
QC value within limits for V 292.402 A Recovery = Not calculated							
Zn 206.200 A†	-2.5	-0.000281	mg/L	0.0003254	-0.000281	mg/L	0.0003254 115.67%
QC value within limits for Zn 206.200 A Recovery = Not calculated							
All analyte(s) passed QC.							

W917018

SVL ANALYTICAL

Log/Preparation Bench Sheet

See Extraction Comments

W917018

Matrix: Solid

Prepared using: SOP 4079 (3010A) - ICPMS

Earliest Due: 04/29/09 Earliest Expiration: 09/29/09 08:50

MS 4079 1.4

			Origin	Hold Time Expires	Home Location	Client	Due Date
W917018-BLK1	Blank	[50mL - 50mL]					
W917018-BS1	LCS	[50mL - 50mL]	Spike 1: 09D0031				
W917018-MS1	Matrix Spike [W9D0297-01]	[50mL - 50mL]	Spike 1: 09D0031				
W917018-MSD1	MS Dup [W9D0297-01]	[50mL - 50mL]	Spike 1: 09D0031				
W9D0297-01	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	NMF-07HHRA-005S1	[50mL - 50mL]	Arizona	30-Sep-09 11:15	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-02	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	NMF-07HHRA-005E1	[50mL - 50mL]	Arizona	30-Sep-09 11:00	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-03	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-002N1	[50mL - 50mL]	Arizona	29-Sep-09 08:50	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-04	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-002S1	[50mL - 50mL]	Arizona	29-Sep-09 08:55	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-05	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-004N1	[50mL - 50mL]	Arizona	29-Sep-09 10:50	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-06	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-004W1	[50mL - 50mL]	Arizona	29-Sep-09 10:55	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-07	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-003N1	[50mL - 50mL]	Arizona	29-Sep-09 13:20	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-08	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-003W1	[50mL - 50mL]	Arizona	29-Sep-09 13:15	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-09	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-005N1	[50mL - 50mL]	Arizona	29-Sep-09 15:20	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-10	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-005E1	[50mL - 50mL]	Arizona	29-Sep-09 15:45	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-11	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-BFD2	[50mL - 50mL]	Arizona	30-Sep-09 12:30	WarmRoom 33 FL	Golder Associates (AZ)	

04/30/2009

Preparation Reagents

Standard	Description	Lot Number
08J0438	HCl, conc.	K2007

Standard	Description	Lot Number
09A0206	HNO3, conc.	K1408

Spike Standards

Standard	Description	Amount (µL)
09D0031	F-26+U	500

Standard	Description	Amount (µL)

Digested By: JP Date/Time: 4/20/09 1500/2100 Instrument ID: PE ICPMS DRC-E

Analyzed By: [signature] Date/Time: 4/28/09

Reviewed By: [signature] Date: 04/29/2009 Data File(s): [signature] 1180

SVL ANALYTICAL, INC. KELLOGG, IDAHO

ICP-MS STANDARDS

DATA SET: 118D

STANDARD	SOURCE/LOT #	PREP DATE	PREP BY
S0/ICB/CCB	N/A	4/28/2009	KWH
Standards Stock	09C0299	3/30/2009	KWH
S1	Standards Stock	4/28/2009	KWH
S2/RCLS	Standards Stock	4/28/2009	KWH
S3	Standards Stock	4/28/2009	KWH
S4	Standards Stock	4/28/2009	KWH
S5	Standards Stock	4/28/2009	KWH
S6	Standards Stock	4/28/2009	KWH
CCV	Standards Stock	4/28/2009	KWH
ICV Stock	09C0298	3/20/2009	KWH
ICV	ICV Stock	4/28/2009	KWH
ICSA	08K0009	4/1/2009	KWH
ICSAB	08K0010	4/1/2009	KWH
Internal Standard	09D0011	4/1/2009	KWH

Analytical Standard Summary

09C0298

145

Description: MS-10PPM ICV STOCK
Standard Type: Other
Solvent: 2%HNO3
Final Volume 200
Vials: 1

Department: ICPMS
Prepared By: Kevin Hathaway
Lot : -
Prepared: 30-Mar-09
Expires: 16-Oct-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	10	mg/L
Antimony	7440-36-0	10	mg/L
Arsenic	7440-38-2	10	mg/L
Barium	7440-39-3	10	mg/L
Beryllium	7440-41-7	10	mg/L
Boron	7440-42-8	10	mg/L
Cadmium	7440-43-9	10	mg/L
Calcium	7440-70-2	10	mg/L
Chromium	7440-47-3	10	mg/L
Cobalt	7440-48-4	10	mg/L
Copper	7440-50-8	10	mg/L
Iron	7439-89-6	10	mg/L
Lead	7439-92-1	10	mg/L
Magnesium	7439-95-4	10	mg/L
Manganese	7439-96-5	10	mg/L
Molybdenum	7439-98-7	10	mg/L
Nickel	7440-02-0	10	mg/L
[illegible]assium	7440-09-7	100	mg/L
[illegible]nium	7782-49-2	10	mg/L
Silica (SiO2)	7631-86-9	10.7	mg/L
Silicon	7440-21-3	5	mg/L
Silver	7440-22-4	10	mg/L
Sodium	7440-23-5	10	mg/L
Thallium	7440-28-0	10	mg/L
Titanium	7440-32-6	10	mg/L
Uranium	7440-61-1	10	mg/L
Vanadium	7440-62-2	10	mg/L
Zinc	7440-66-6	10	mg/L

Analytical Standard Summary

09C0298

146

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08J0536	QCS-26 (0816541)	Magnesium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Aluminum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Antimony	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Arsenic	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Barium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Beryllium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Boron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Cadmium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Calcium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Chromium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Cobalt	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Copper	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Lead	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Zinc	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Manganese	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Molybdenum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Nickel	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Potassium	30-Oct-08	Vendor	16-Oct-09	1000 ug/mL	20
08J0536	QCS-26 (0816541)	Selenium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Silica (SiO2)	30-Oct-08	Vendor	16-Oct-09	107 ug/mL	20
08J0536	QCS-26 (0816541)	Silicon	30-Oct-08	Vendor	16-Oct-09	50 ug/mL	20
08J0536	QCS-26 (0816541)	Silver	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Sodium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Thallium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Titanium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Vanadium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Iron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08E0137	Uranium	Uranium	19-May-08	Kevin Hathaway	13-Nov-09	1000 ug/mL	2

3/30/2009

04/16/2009

Analytical Standard Summary

09C0299

147

Description: MS-10PPM CAL STOCK
Standard Type: Calibration Standard
Solvent: 2%HNO3
Final Volume 200
Vials: 1

Department: ICPMS
Prepared By: Kevin Hathaway
Lot : -
Prepared: 30-Mar-09
Expires: 29-Aug-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	10	ug/mL
Antimony	7440-36-0	10	ug/mL
Arsenic	7440-38-2	10	ug/mL
Barium	7440-39-3	10	ug/mL
Beryllium	7440-41-7	10	ug/mL
Boron	7440-42-8	10	ug/mL
Cadmium	7440-43-9	10	ug/mL
Calcium	7440-70-2	10	ug/mL
Chromium	7440-47-3	10	ug/mL
Cobalt	7440-48-4	10	ug/mL
Copper	7440-50-8	10	ug/mL
Iron	7439-89-6	10	ug/mL
Lead	7439-92-1	10	ug/mL
Magnesium	7439-95-4	10	ug/mL
Manganese	7439-96-5	10	ug/mL
Molybdenum	7439-98-7	10	ug/mL
Nickel	7440-02-0	10	ug/mL
[illegible]assium	7440-09-7	100	ug/mL
[illegible]nium	7782-49-2	10	ug/mL
Silica (SiO2)	7631-86-9	10.7	ug/mL
Silicon	7440-21-3	5	ug/mL
Silver	7440-22-4	10	ug/mL
Sodium	7440-23-5	10	ug/mL
Thallium	7440-28-0	10	ug/mL
Titanium	7440-32-6	10	ug/mL
Uranium	7440-61-1	10	ug/mL
Vanadium	7440-62-2	10	ug/mL
Zinc	7440-66-6	10	ug/mL

Analytical Standard Summary

09C0299

148

ent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08C0081	Uranium	Uranium	10-Mar-08	Vendor	29-Aug-09	1000 ug/mL	2
08J0535	QCS-26 (0816542)	Magnesium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Aluminum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Antimony	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Arsenic	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Barium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Beryllium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Boron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Cadmium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Calcium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Chromium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Cobalt	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Copper	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Lead	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Zinc	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Manganese	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Molybdenum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Nickel	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Potassium	30-Oct-08	Vendor	16-Oct-09	1000 ug/mL	20
08J0535	QCS-26 (0816542)	Selenium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Silica (SiO2)	30-Oct-08	Vendor	16-Oct-09	107 ug/mL	20
08J0535	QCS-26 (0816542)	Silicon	30-Oct-08	Vendor	16-Oct-09	50 ug/mL	20
08J0535	QCS-26 (0816542)	Silver	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Sodium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Thallium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Titanium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Vanadium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Iron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20

LAW 16 3/30/2005 09/16/2009

Analytical Standard Summary

09D0011

14C

Description: MS-INTERNAL STANDARD SOL
Standard Type: Internal Standard
Solvent: 2%HNO3
Final Volume 1000
Vials: 1

Department: ICPMS
Prepared By: Kevin Hathaway
Lot : 08K0215
Prepared: 01-Apr-09
Expires: 18-May-09

Comments:

Analyte	CAS Number	Concentration	Units
Bismuth	7440-69-9	0.1	ug/mL
Gallium	7440-55-3	0.27	ug/mL
Holmium	7440-60-0	0.1	ug/mL
Indium	7440-74-6	0.1	ug/mL
Lithium	7439-93-2	0.1	ug/mL
Rhodium	7440-16-6	0.1	ug/mL
Scandium	7440-20-2	0.1	ug/mL
Terbium	7440-27-9	0.1	ug/mL
Yttrium	7440-65-5	0.1	ug/mL

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08D0021	MS-INTERNAL STD-MIX-1	Yttrium	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08D0021	MS-INTERNAL STD-MIX-1	Terbium	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08D0021	MS-INTERNAL STD-MIX-1	Scandium	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08D0021	MS-INTERNAL STD-MIX-1	Lithium	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08D0021	MS-INTERNAL STD-MIX-1	Indium	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08D0021	MS-INTERNAL STD-MIX-1	Holmium	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08D0021	MS-INTERNAL STD-MIX-1	Bismuth	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08K0215	MS-INTERNAL STD-MIX-2	Rhodium	18-Nov-08	Kevin Hathaway	18-May-09	10 ug/mL	10
08K0215	MS-INTERNAL STD-MIX-2	Gallium	18-Nov-08	Kevin Hathaway	18-May-09	27 ug/mL	10

KH 4/1/09 04/16/2009

Analytical Standard Summary

08K0009

150

Description: ICP-MS-ICSA
Standard Type: Reference Material
Solvent: 2% HNO3
Final Volume 250
Vials: 1

Department: ICPMS
Prepared By: Kevin Hathaway
Lot : 0805303
Prepared: 03-Nov-08
Expires: 20-Oct-09

Comments:

Analyte	CAS Number	Concentration	Units	Control Limits
Aluminum	7429-90-5	500	mg/L	80-120
Calcium	7440-70-2	500	mg/L	80-120
Carbon	7440-44-0	1000	mg/L	80-120
Chloride	16887-00-6	3600	mg/L	80-120
Iron	7439-89-6	500	mg/L	80-120
Magnesium	7439-95-4	500	mg/L	80-120
Molybdenum	7439-98-7	10	mg/L	80-120
Phosphorus	7723-14-0	500	mg/L	80-120
Potassium	7440-09-7	500	mg/L	80-120
Sodium	7440-23-5	500	mg/L	80-120
Sulfur	7704-34-9	500	mg/L	80-120
Titanium	7440-32-6	10	mg/L	80-120

Prepared By 11/3/08 Date

DG 11/14/08 Reviewed By Date

Analytical Standard Summary

08K0010

151

Description: ICP-MS-ICSAB
Standard Type: Reference Material
Solvent: 2% HNO3
Final Volume 1
Vials: 1

Department: ICPMS
Prepared By: Kevin Hathaway
Lot : 0802405
Prepared: 03-Nov-08
Expires: 20-Oct-09

Comments:

Analyte	CAS Number	Concentration	Units	Control Limits
Aluminum	7429-90-5	500	mg/L	80-120
Arsenic	7440-38-2	0.1	mg/L	80-120
Cadmium	7440-43-9	0.05	mg/L	80-120
Calcium	7440-70-2	500	mg/L	80-120
Carbon	7440-44-0	1000	mg/L	80-120
Chloride	16887-00-6	3600	mg/L	80-120
Chromium	7440-47-3	0.1	mg/L	80-120
Cobalt	7440-48-4	0.2	mg/L	80-120
Copper	7440-50-8	0.1	mg/L	80-120
Iron	7439-89-6	500	mg/L	80-120
Magnesium	7439-95-4	500	mg/L	80-120
Manganese	7439-96-5	0.1	mg/L	80-120
Molybdenum	7439-98-7	10	mg/L	80-120
Nickel	7440-02-0	0.2	mg/L	80-120
Phosphorus	7723-14-0	500	mg/L	80-120
Potassium	7440-09-7	500	mg/L	80-120
Selenium	7782-49-2	0.1	mg/L	80-120
[illegible]er	7440-22-4	0.1	mg/L	80-120
[illegible]um	7440-23-5	500	mg/L	80-120
Sulfur	7704-34-9	500	mg/L	80-120
Titanium	7440-32-6	10	mg/L	80-120
Vanadium	7440-62-2	0.2	mg/L	80-120
Zinc	7440-66-6	0.1	mg/L	80-120

LAW 11/3/08

DG 11/14/08

Quantitative Analysis Calibration Report

152

File Name: 118D.cal
File Path: C:\Elandata\System
Calibration Type: External Calibration

Analyte	Mass	Curve Type	Slope	Intercept	Corr. Coeff.
Ga	70.925	Linear Thru Zero	0.00	0.00	0.000000
As	74.922	Linear Thru Zero	0.00	0.00	0.999973 ✓
Cl	34.969	Linear Thru Zero	0.00	0.00	0.000000
Kr	82.914	Linear Thru Zero	0.00	0.00	0.000000
Ru	98.906	Linear Thru Zero	0.00	0.00	0.000000
Pd	104.905	Linear Thru Zero	0.00	0.00	0.000000
Sn	117.902	Linear Thru Zero	0.00	0.00	0.000000

Quantitative Analysis - Summary Report
Sample ID: Cal Blank
Sample Date/Time: Tuesday, April 28, 2009 09:40:55
Solution Type: Blank
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\Cal Blank.001
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	461878.70				ug/L
[	As	75	-7157.06				ug/L
	Cl	35	209354874.90				ug/L
	Kr	83	36.33				ug/L
	Ru	99	0.00				ug/L
	Pd	105	2646.91				ug/L
	Sn	118	256.67				ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	462040.96				ug/L
As	75	-7203.84				ug/L
Cl	35	210232908.31				ug/L
Kr	83	35.67				ug/L
Ru	99	0.00				ug/L
Pd	105	2600.24				ug/L
Sn	118	290.00				ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	464798.27				ug/L
As	75	-6967.79				ug/L
Cl	35	207551522.22				ug/L
Kr	83	34.00				ug/L
Ru	99	0.00				ug/L
Pd	105	2920.30				ug/L
Sn	118	270.00				ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	458796.88				ug/L
As	75	-7299.55				ug/L
Cl	35	210280194.16				ug/L
Kr	83	39.33				ug/L
Ru	99	0.00				ug/L
Pd	105	2420.20				ug/L
Sn	118	210.00				ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
[>	Ga	71		
[	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: Cal Std 1
Sample Date/Time: Tuesday, April 28, 2009 09:42:48
Solution Type: Standard
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\Cal Std 1.002
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	462476.26	462476.264			ug/L
	As	75	-7126.75	0.000	**0.1000**	769.577	ug/L
	Cl	35	212560114.08	3205239.184			ug/L
	Kr	83	30.89	-5.444			ug/L
	Ru	99	0.00	0.000			ug/L
	Pd	105	2576.90	-70.013			ug/L
	Sn	118	196.67	-60.001			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	462895.98	462895.978	461878.702		ug/L
As	75	-7124.57	0.000	-7157.058	**0.11055**	ug/L
Cl	35	215807076.08	6452201.181	209354874.897		ug/L
Kr	83	34.67	-1.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2400.20	-246.712	2646.913		ug/L
Sn	118	200.00	-56.668	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	453908.38	453908.378	461878.702		ug/L
As	75	-6663.67	0.001	-7157.058	**0.86425**	ug/L
Cl	35	213520665.95	4165791.048	209354874.897		ug/L
Kr	83	31.67	-4.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2880.29	233.377	2646.913		ug/L
Sn	118	170.00	-86.668	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	470624.44	470624.436	461878.702		ug/L
As	75	-7592.02	-0.001	-7157.058	**-0.67480**	ug/L
Cl	35	208352600.22	-1002274.677	209354874.897		ug/L
Kr	83	26.33	-10.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2450.21	-196.703	2646.913		ug/L
Sn	118	220.00	-36.667	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
[>	Ga	71		
[	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: Cal Std 2
Sample Date/Time: Tuesday, April 28, 2009 09:44:41
Solution Type: Standard
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\Cal Std 2.003
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	449990.84	449990.839			ug/L
[	As	75	-5948.01	0.002	**1.0058**	6.715	ug/L
	Cl	35	211034913.49	1680038.589			ug/L
	Kr	83	32.89	-3.444			ug/L
	Ru	99	5.00	5.000			ug/L
	Pd	105	2513.55	-133.359			ug/L
	Sn	118	256.67	-0.000			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	457586.98	457586.985	461878.702		ug/L
As	75	-6006.14	0.002	-7157.058	**1.04617**	ug/L
Cl	35	212864227.03	3509352.129	209354874.897		ug/L
Kr	83	32.33	-4.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2480.22	-166.698	2646.913		ug/L
Sn	118	250.00	-6.667	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	436984.77	436984.769	461878.702		ug/L
As	75	-5738.40	0.002	-7157.058	**1.04347**	ug/L
Cl	35	206959058.28	-2395816.619	209354874.897		ug/L
Kr	83	36.67	0.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2430.21	-216.707	2646.913		ug/L
Sn	118	230.00	-26.667	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	455400.76	455400.764	461878.702		ug/L
As	75	-6099.49	0.002	-7157.058	**0.92787**	ug/L
Cl	35	213281455.15	3926580.256	209354874.897		ug/L
Kr	83	29.67	-6.667	36.333		ug/L
Ru	99	15.00	15.000	0.000		ug/L
Pd	105	2630.24	-16.671	2646.913		ug/L
Sn	118	290.00	33.334	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: Cal Std 3
Sample Date/Time: Tuesday, April 28, 2009 09:46:34
Solution Type: Standard
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\Cal Std 3.004
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	458466.60	458466.599			ug/L
[	As	75	5518.27	0.028	**10.0178**	2.886	ug/L
	Cl	35	212258782.66	2903907.759			ug/L
	Kr	83	34.89	-1.444			ug/L
	Ru	99	13.33	13.333			ug/L
	Pd	105	2550.23	-96.685			ug/L
	Sn	118	236.67	-20.000			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	456767.37	456767.372	461878.702		ug/L
As	75	5652.77	0.028	-7157.058	**10.14052**	ug/L
Cl	35	216338346.56	6983471.662	209354874.897		ug/L
Kr	83	37.00	0.667	36.333		ug/L
Ru	99	15.00	15.000	0.000		ug/L
Pd	105	2450.21	-196.703	2646.913		ug/L
Sn	118	270.00	13.334	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	460432.25	460432.248	461878.702		ug/L
As	75	5124.84	0.027	-7157.058	**9.68751**	ug/L
Cl	35	209801772.58	446897.682	209354874.897		ug/L
Kr	83	37.00	0.667	36.333		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2720.26	73.346	2646.913		ug/L
Sn	118	230.00	-26.667	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	458200.18	458200.177	461878.702		ug/L
As	75	5777.21	0.028	-7157.058	**10.22525**	ug/L
Cl	35	210636228.83	1281353.935	209354874.897		ug/L
Kr	83	30.67	-5.667	36.333		ug/L
Ru	99	20.00	20.000	0.000		ug/L
Pd	105	2480.22	-166.698	2646.913		ug/L
Sn	118	210.00	-46.667	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
⌈>	Ga	71		
⌊	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: Cal Std 4
Sample Date/Time: Tuesday, April 28, 2009 09:48:28
Solution Type: Standard
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\Cal Std 4.005
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	460402.51	460402.512			ug/L
[	As	75	18639.70	0.056	**20.0735**	0.822	ug/L
	Cl	35	211679299.15	2324424.251			ug/L
	Kr	83	38.89	2.556			ug/L
	Ru	99	6.67	6.667			ug/L
	Pd	105	2363.53	-283.384			ug/L
	Sn	118	263.34	6.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	452205.64	452205.635	461878.702		ug/L
As	75	18535.28	0.056	-7157.058	**20.25204**	ug/L
Cl	35	213467817.05	4112942.152	209354874.897		ug/L
Kr	83	39.33	3.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2260.18	-386.735	2646.913		ug/L
Sn	118	240.00	-16.667	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	462621.29	462621.292	461878.702		ug/L
As	75	18690.92	0.056	-7157.058	**20.04179**	ug/L
Cl	35	213025555.24	3670680.338	209354874.897		ug/L
Kr	83	41.67	5.333	36.333		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2320.19	-326.725	2646.913		ug/L
Sn	118	280.00	23.334	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	466380.61	466380.609	461878.702		ug/L
As	75	18692.91	0.056	-7157.058	**19.92655**	ug/L
Cl	35	208544525.16	-810349.739	209354874.897		ug/L
Kr	83	35.67	-0.667	36.333		ug/L
Ru	99	15.00	15.000	0.000		ug/L
Pd	105	2510.22	-136.693	2646.913		ug/L
Sn	118	270.00	13.334	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: Cal Std 5
Sample Date/Time: Tuesday, April 28, 2009 09:50:21
Solution Type: Standard
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\Cal Std 5.006
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
⌈>	Ga	71	465274.82	465274.816			ug/L
⌊	As	75	59766.64	0.144	**50.2621**	0.444	ug/L
	Cl	35	208477768.66	-877106.239			ug/L
	Kr	83	45.89	9.556			ug/L
	Ru	99	30.00	30.000			ug/L
	Pd	105	2436.87	-210.039			ug/L
	Sn	118	200.00	-56.668			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	464052.61	464052.609	461878.702		ug/L
As	75	59692.32	0.144	-7157.058	**50.32464**	ug/L
Cl	35	207952061.22	-1402813.678	209354874.897		ug/L
Kr	83	48.67	12.333	36.333		ug/L
Ru	99	20.00	20.000	0.000		ug/L
Pd	105	2380.20	-266.715	2646.913		ug/L
Sn	118	220.00	-36.667	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	467281.34	467281.337	461878.702		ug/L
As	75	60271.55	0.144	-7157.058	**50.44712**	ug/L
Cl	35	207053629.99	-2301244.910	209354874.897		ug/L
Kr	83	47.33	11.000	36.333		ug/L
Ru	99	20.00	20.000	0.000		ug/L
Pd	105	2380.20	-266.715	2646.913		ug/L
Sn	118	250.00	-6.667	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	464490.50	464490.501	461878.702		ug/L
As	75	59336.05	0.143	-7157.058	**50.01449**	ug/L
Cl	35	210427614.77	1072739.872	209354874.897		ug/L
Kr	83	41.67	5.333	36.333		ug/L
Ru	99	50.00	50.000	0.000		ug/L
Pd	105	2550.23	-96.686	2646.913		ug/L
Sn	118	130.00	-126.668	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: Cal Std 6
Sample Date/Time: Tuesday, April 28, 2009 09:52:14
Solution Type: Standard
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\Cal Std 6.007
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	461056.21	461056.213			ug/L
[	As	75	91725.93	0.214	**74.9608**	1.601	ug/L
	Cl	35	212835484.64	3480609.747			ug/L
	Kr	83	48.44	12.111			ug/L
	Ru	99	55.00	55.000			ug/L
	Pd	105	2420.21	-226.708			ug/L
	Sn	118	263.34	6.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	468432.12	468432.119	461878.702		ug/L
As	75	91589.36	0.211	-7157.058	**73.75277**	ug/L
Cl	35	214594332.99	5239458.093	209354874.897		ug/L
Kr	83	49.33	13.000	36.333		ug/L
Ru	99	70.00	70.000	0.000		ug/L
Pd	105	2410.20	-236.710	2646.913		ug/L
Sn	118	370.00	113.336	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	455516.36	455516.364	461878.702		ug/L
As	75	92192.12	0.218	-7157.058	**76.15289**	ug/L
Cl	35	212185535.94	2830661.044	209354874.897		ug/L
Kr	83	52.00	15.667	36.333		ug/L
Ru	99	40.00	40.000	0.000		ug/L
Pd	105	2300.19	-346.728	2646.913		ug/L
Sn	118	190.00	-66.668	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	459220.16	459220.156	461878.702		ug/L
As	75	91396.31	0.215	-7157.058	**74.97668**	ug/L
Cl	35	211726585.00	2371710.105	209354874.897		ug/L
Kr	83	44.00	7.667	36.333		ug/L
Ru	99	55.00	55.000	0.000		ug/L
Pd	105	2550.23	-96.686	2646.913		ug/L
Sn	118	230.00	-26.667	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: ICV
Sample Date/Time: Tuesday, April 28, 2009 09:54:07
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\ICV.008
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	461968.32	461968.319			ug/L
	As	75	25516.98	0.071	**24.7229**	1.422	ug/L
	Cl	35	206262750.89	-3092124.003			ug/L
	Kr	83	39.44	3.111			ug/L
	Ru	99	20.00	20.000			ug/L
	Pd	105	2250.18	-396.735			ug/L
	Sn	118	256.67	-0.000			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	461702.27	461702.266	461878.702		ug/L
As	75	25612.37	0.071	-7157.058	**24.80435**	ug/L
Cl	35	207112041.92	-2242832.973	209354874.897		ug/L
Kr	83	41.67	5.333	36.333		ug/L
Ru	99	25.00	25.000	0.000		ug/L
Pd	105	2340.19	-306.722	2646.913		ug/L
Sn	118	270.00	13.334	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	465903.41	465903.411	461878.702		ug/L
As	75	25223.60	0.070	-7157.058	**24.33787**	ug/L
Cl	35	206653090.99	-2701783.912	209354874.897		ug/L
Kr	83	39.33	3.000	36.333		ug/L
Ru	99	15.00	15.000	0.000		ug/L
Pd	105	2400.20	-246.712	2646.913		ug/L
Sn	118	230.00	-26.667	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	458299.28	458299.281	461878.702		ug/L
As	75	25714.97	0.072	-7157.058	**25.02656**	ug/L
Cl	35	205023119.77	-4331755.125	209354874.897		ug/L
Kr	83	37.33	1.000	36.333		ug/L
Ru	99	20.00	20.000	0.000		ug/L
Pd	105	2010.14	-636.772	2646.913		ug/L
Sn	118	270.00	13.334	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		100.019
	As	75	98.892	
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: ICB
Sample Date/Time: Tuesday, April 28, 2009 09:56:01
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\ICB.009
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	461009.52	461009.516			ug/L
	As	75	-6889.60	0.001	**0.1889**	309.367	ug/L
	Cl	35	212769655.32	3414780.421			ug/L
	Kr	83	40.22	3.889			ug/L
	Ru	99	1.67	1.667			ug/L
	Pd	105	2376.86	-270.049			ug/L
	Sn	118	220.00	-36.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	456821.05	456821.048	461878.702		ug/L
As	75	-7523.46	-0.001	-7157.058	**-0.34029**	ug/L
Cl	35	214622148.20	5267273.302	209354874.897		ug/L
Kr	83	43.67	7.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2370.20	-276.717	2646.913		ug/L
Sn	118	220.00	-36.667	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	460665.59	460665.593	461878.702		ug/L
As	75	-7018.40	0.000	-7157.058	**0.09094**	ug/L
Cl	35	212939328.09	3584453.192	209354874.897		ug/L
Kr	83	42.67	6.333	36.333		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2410.20	-236.710	2646.913		ug/L
Sn	118	210.00	-46.667	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	465541.91	465541.908	461878.702		ug/L
As	75	-6126.95	0.002	-7157.058	**0.81598**	ug/L
Cl	35	210747489.67	1392614.768	209354874.897		ug/L
Kr	83	34.33	-2.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2350.19	-296.720	2646.913		ug/L
Sn	118	230.00	-26.667	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		99.812
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: RCLS
Sample Date/Time: Tuesday, April 28, 2009 09:57:54
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\RCLS.010
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	465959.24	465959.239			ug/L
[	As	75	-5405.51	0.004	**1.3616**	16.401	ug/L
	Cl	35	218346604.61	8991729.710			ug/L
	Kr	83	42.22	5.889			ug/L
	Ru	99	0.00	0.000			ug/L
	Pd	105	2550.23	-96.684			ug/L
	Sn	118	273.34	16.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	464471.91	464471.911	461878.702		ug/L
As	75	-5049.89	0.005	-7157.058	**1.61585**	ug/L
Cl	35	220329828.97	10974954.070	209354874.897		ug/L
Kr	83	41.00	4.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2670.25	23.336	2646.913		ug/L
Sn	118	300.00	43.334	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	467506.53	467506.528	461878.702		ug/L
As	75	-5543.23	0.004	-7157.058	**1.27170**	ug/L
Cl	35	216552523.66	7197648.767	209354874.897		ug/L
Kr	83	40.67	4.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2220.17	-426.741	2646.913		ug/L
Sn	118	220.00	-36.667	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	465899.28	465899.279	461878.702		ug/L
As	75	-5623.43	0.003	-7157.058	**1.19724**	ug/L
Cl	35	218157461.19	8802586.293	209354874.897		ug/L
Kr	83	45.00	8.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2760.27	113.353	2646.913		ug/L
Sn	118	300.00	43.334	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		100.883
	As	75	136.159	
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: ICSA
Sample Date/Time: Tuesday, April 28, 2009 09:59:48
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\ICSA.011
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	359277.55	359277.553			ug/L
	As	75	-5270.91	0.001	**0.2867**	85.197	ug/L
	Cl	35	178670064.14	-30684810.760			ug/L
	Kr	83	151.45	115.112			ug/L
	Ru	99	30.00	30.000			ug/L
	Pd	105	2613.57	-33.340			ug/L
	Sn	118	300.00	43.334			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	367640.49	367640.486	461878.702		ug/L
As	75	-5260.96	0.001	-7157.058	**0.41433**	ug/L
Cl	35	181825235.95	-27529638.951	209354874.897		ug/L
Kr	83	139.33	103.001	36.333		ug/L
Ru	99	15.00	15.000	0.000		ug/L
Pd	105	2710.26	63.344	2646.913		ug/L
Sn	118	240.00	-16.667	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	355095.06	355095.062	461878.702		ug/L
As	75	-5497.24	0.000	-7157.058	**0.00507**	ug/L
Cl	35	177588979.70	-31765895.194	209354874.897		ug/L
Kr	83	158.33	122.001	36.333		ug/L
Ru	99	35.00	35.000	0.000		ug/L
Pd	105	2680.25	33.338	2646.913		ug/L
Sn	118	370.00	113.336	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	355097.11	355097.112	461878.702		ug/L
As	75	-5054.53	0.001	-7157.058	**0.44084**	ug/L
Cl	35	176595976.76	-32758898.134	209354874.897		ug/L
Kr	83	156.67	120.334	36.333		ug/L
Ru	99	40.00	40.000	0.000		ug/L
Pd	105	2450.21	-196.703	2646.913		ug/L
Sn	118	290.00	33.334	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
⌈>	Ga	71		77.786
⌊	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: ICSAB
Sample Date/Time: Tuesday, April 28, 2009 10:01:42
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\ICSAB.012
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	367049.40	367049.403			ug/L
	As	75	5503.16	0.030	**10.6598**	2.507	ug/L
	Cl	35	174560830.68	-34794044.218			ug/L
	Kr	83	154.89	118.556			ug/L
	Ru	99	38.33	38.333			ug/L
	Pd	105	2680.25	33.339			ug/L
	Sn	118	366.67	110.003			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	361976.57	361976.573	461878.702		ug/L
As	75	5701.93	0.031	-7157.058	**10.92134**	ug/L
Cl	35	176281664.91	-33073209.990	209354874.897		ug/L
Kr	83	163.00	126.668	36.333		ug/L
Ru	99	20.00	20.000	0.000		ug/L
Pd	105	2440.21	-206.705	2646.913		ug/L
Sn	118	320.00	63.335	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	361705.84	361705.844	461878.702		ug/L
As	75	5438.42	0.031	-7157.058	**10.67083**	ug/L
Cl	35	175666948.80	-33687926.096	209354874.897		ug/L
Kr	83	145.33	109.001	36.333		ug/L
Ru	99	40.00	40.000	0.000		ug/L
Pd	105	2770.27	123.355	2646.913		ug/L
Sn	118	470.01	213.339	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	377465.79	377465.792	461878.702		ug/L
As	75	5369.14	0.030	-7157.058	**10.38728**	ug/L
Cl	35	171733878.33	-37620996.567	209354874.897		ug/L
Kr	83	156.33	120.001	36.333		ug/L
Ru	99	55.00	55.000	0.000		ug/L
Pd	105	2830.28	183.367	2646.913		ug/L
Sn	118	310.00	53.334	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		79.469
	As	75	106.598	
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: CCV
Sample Date/Time: Tuesday, April 28, 2009 10:03:35
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\CCV.013
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	460188.60	460188.600			ug/L
	As	75	58027.12	0.142	**49.4865**	0.672	ug/L
	Cl	35	201304226.41	-8050648.492			ug/L
	Kr	83	40.22	3.889			ug/L
	Ru	99	36.67	36.667			ug/L
	Pd	105	2586.90	-60.012			ug/L
	Sn	118	250.00	-6.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	459195.38	459195.378	461878.702		ug/L
As	75	57591.82	0.141	-7157.058	**49.25077**	ug/L
Cl	35	201621319.78	-7733555.115	209354874.897		ug/L
Kr	83	45.67	9.333	36.333		ug/L
Ru	99	35.00	35.000	0.000		ug/L
Pd	105	2720.26	73.346	2646.913		ug/L
Sn	118	280.00	23.334	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	460552.02	460552.018	461878.702		ug/L
As	75	57881.96	0.141	-7157.058	**49.34183**	ug/L
Cl	35	200672821.17	-8682053.723	209354874.897		ug/L
Kr	83	33.33	-3.000	36.333		ug/L
Ru	99	35.00	35.000	0.000		ug/L
Pd	105	2630.24	-16.671	2646.913		ug/L
Sn	118	260.00	3.333	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	460818.40	460818.405	461878.702		ug/L
As	75	58607.59	0.143	-7157.058	**49.86679**	ug/L
Cl	35	201618538.26	-7736336.636	209354874.897		ug/L
Kr	83	41.67	5.333	36.333		ug/L
Ru	99	40.00	40.000	0.000		ug/L
Pd	105	2410.20	-236.710	2646.913		ug/L
Sn	118	210.00	-46.667	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
[>	Ga	71		99.634
[	As	75	98.973	
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: CCB
Sample Date/Time: Tuesday, April 28, 2009 10:05:29
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\CCB.014
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	452763.06	452763.061			ug/L
	As	75	-6338.01	0.001	**0.5222**	54.094	ug/L
	Cl	35	202183186.99	-7171687.905			ug/L
	Kr	83	32.11	-4.222			ug/L
	Ru	99	5.00	5.000			ug/L
	Pd	105	2403.54	-243.375			ug/L
	Sn	118	210.00	-46.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	456001.48	456001.478	461878.702		ug/L
As	75	-6051.52	0.002	-7157.058	**0.77755**	ug/L
Cl	35	204099654.85	-5255220.045	209354874.897		ug/L
Kr	83	30.00	-6.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2410.20	-236.710	2646.913		ug/L
Sn	118	250.00	-6.667	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	451646.35	451646.353	461878.702		ug/L
As	75	-6261.66	0.002	-7157.058	**0.57021**	ug/L
Cl	35	200586594.03	-8768280.869	209354874.897		ug/L
Kr	83	34.33	-2.000	36.333		ug/L
Ru	99	15.00	15.000	0.000		ug/L
Pd	105	2030.14	-616.769	2646.913		ug/L
Sn	118	190.00	-66.668	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	450641.35	450641.352	461878.702		ug/L
As	75	-6700.85	0.001	-7157.058	**0.21878**	ug/L
Cl	35	201863312.10	-7491562.802	209354874.897		ug/L
Kr	83	32.00	-4.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2770.27	123.355	2646.913		ug/L
Sn	118	190.00	-66.668	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		98.026
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W917018-BLK1
Sample Date/Time: Tuesday, April 28, 2009 10:07:23
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W917018-BLK1.015
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	459573.06	459573.055			ug/L
	As	75	-6841.12	0.001	**0.2110**	162.890	ug/L
	Cl	35	212780781.40	3425906.504			ug/L
	Kr	83	34.11	-2.222			ug/L
	Ru	99	1.67	1.667			ug/L
	Pd	105	2766.93	120.022			ug/L
	Sn	118	273.34	16.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	463088.06	463088.055	461878.702		ug/L
As	75	-6424.15	0.002	-7157.058	**0.56730**	ug/L
Cl	35	214040810.34	4685935.446	209354874.897		ug/L
Kr	83	33.67	-2.667	36.333		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2750.26	103.351	2646.913		ug/L
Sn	118	350.00	93.335	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	454269.59	454269.592	461878.702		ug/L
As	75	-7193.03	-0.000	-7157.058	**-0.11839**	ug/L
Cl	35	212697335.78	3342460.879	209354874.897		ug/L
Kr	83	37.00	0.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2880.29	233.377	2646.913		ug/L
Sn	118	260.00	3.333	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	461361.52	461361.519	461878.702		ug/L
As	75	-6906.18	0.001	-7157.058	**0.18398**	ug/L
Cl	35	211604198.09	2249323.188	209354874.897		ug/L
Kr	83	31.67	-4.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2670.25	23.336	2646.913		ug/L
Sn	118	210.00	-46.667	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		99.501
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W917018-BS1
Sample Date/Time: Tuesday, April 28, 2009 10:09:17
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W917018-BS1.016
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	458693.29	458693.288			ug/L
	As	75	5454.07	0.027	**9.5747**	5.252	ug/L
	Cl	35	224124750.57	14769875.673			ug/L
	Kr	83	33.78	-2.556			ug/L
	Ru	99	11.67	11.667			ug/L
	Pd	105	2760.27	113.354			ug/L
	Sn	118	310.00	53.334			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	461981.07	461981.066	461878.702		ug/L
As	75	5835.71	0.028	-7157.058	**9.83077**	ug/L
Cl	35	226240560.76	16885685.861	209354874.897		ug/L
Kr	83	36.67	0.333	36.333		ug/L
Ru	99	10.00	10.000	0.000		ug/L
Pd	105	2640.24	-6.669	2646.913		ug/L
Sn	118	290.00	33.334	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	451004.55	451004.548	461878.702		ug/L
As	75	5783.73	0.028	-7157.058	**9.89794**	ug/L
Cl	35	223114131.33	13759256.434	209354874.897		ug/L
Kr	83	28.00	-8.333	36.333		ug/L
Ru	99	10.00	10.000	0.000		ug/L
Pd	105	2770.27	123.355	2646.913		ug/L
Sn	118	280.00	23.334	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	463094.25	463094.251	461878.702		ug/L
As	75	4742.76	0.026	-7157.058	**8.99529**	ug/L
Cl	35	223019559.62	13664684.725	209354874.897		ug/L
Kr	83	36.67	0.333	36.333		ug/L
Ru	99	15.00	15.000	0.000		ug/L
Pd	105	2870.29	223.375	2646.913		ug/L
Sn	118	360.00	103.336	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
[>	Ga	71		99.310
[	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W9D0297-01
Sample Date/Time: Tuesday, April 28, 2009 10:11:10
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W9D0297-01.017
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
⌈>	Ga	71	456414.37	456414.371			ug/L
⌊	As	75	13367.19	0.045	**15.6645**	4.515	ug/L
	Cl	35	208978442.41	-376432.487			ug/L
	Kr	83	42.11	5.778			ug/L
	Ru	99	0.00	0.000			ug/L
	Pd	105	2740.27	93.352			ug/L
	Sn	118	1266.72	1010.054			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	467151.18	467151.183	461878.702		ug/L
As	75	12758.02	0.043	-7157.058	**14.96097**	ug/L
Cl	35	207554303.74	-1800571.159	209354874.897		ug/L
Kr	83	43.67	7.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2950.30	303.391	2646.913		ug/L
Sn	118	1250.05	993.386	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	459052.91	459052.907	461878.702		ug/L
As	75	13451.22	0.045	-7157.058	**15.65714**	ug/L
Cl	35	209089703.24	-265171.654	209354874.897		ug/L
Kr	83	40.33	4.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2890.29	243.379	2646.913		ug/L
Sn	118	1320.06	1063.392	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	443039.02	443039.024	461878.702		ug/L
As	75	13892.32	0.047	-7157.058	**16.37530**	ug/L
Cl	35	210291320.25	936445.350	209354874.897		ug/L
Kr	83	42.33	6.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2380.20	-266.715	2646.913		ug/L
Sn	118	1230.05	973.384	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		98.817
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W917018L1
Sample Date/Time: Tuesday, April 28, 2009 10:13:03
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W917018L1.018
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	471700.64	471700.644			ug/L
[	As	75	-517.62	0.014	**5.0299**	4.362	ug/L
	Cl	35	143160241.89	-66194633.007			ug/L
	Kr	83	39.33	3.000			ug/L
	Ru	99	1.67	1.667			ug/L
	Pd	105	2330.19	-316.723			ug/L
	Sn	118	400.01	143.337			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	462420.96	462420.960	461878.702		ug/L
As	75	-845.70	0.014	-7157.058	**4.77661**	ug/L
Cl	35	143520912.43	-65833962.471	209354874.897		ug/L
Kr	83	43.33	7.000	36.333		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2350.19	-296.720	2646.913		ug/L
Sn	118	380.01	123.336	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	468202.78	468202.782	461878.702		ug/L
As	75	-338.60	0.015	-7157.058	**5.16305**	ug/L
Cl	35	142555724.69	-66799150.204	209354874.897		ug/L
Kr	83	35.33	-1.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2340.19	-306.722	2646.913		ug/L
Sn	118	470.01	213.339	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	484478.19	484478.189	461878.702		ug/L
As	75	-368.55	0.015	-7157.058	**5.14994**	ug/L
Cl	35	143404088.55	-65950786.347	209354874.897		ug/L
Kr	83	39.33	3.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2300.19	-346.728	2646.913		ug/L
Sn	118	350.00	93.335	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
[>	Ga	71		102.127
[	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W917018-MS1
Sample Date/Time: Tuesday, April 28, 2009 10:14:57
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W917018-MS1.019
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	464946.58	464946.580			ug/L
[	As	75	23259.55	0.066	**22.9048**	2.715	ug/L
	Cl	35	218715619.71	9360744.808			ug/L
	Kr	83	39.78	3.444			ug/L
	Ru	99	10.00	10.000			ug/L
	Pd	105	2773.61	126.692			ug/L
	Sn	118	1023.37	766.701			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	471721.75	471721.752	461878.702		ug/L
As	75	22667.90	0.064	-7157.058	**22.21092**	ug/L
Cl	35	219400801.01	10045926.109	209354874.897		ug/L
Kr	83	37.33	1.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2390.20	-256.713	2646.913		ug/L
Sn	118	970.03	713.364	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	458838.17	458838.171	461878.702		ug/L
As	75	23205.09	0.066	-7157.058	**23.09170**	ug/L
Cl	35	216599809.52	7244934.621	209354874.897		ug/L
Kr	83	39.00	2.667	36.333		ug/L
Ru	99	20.00	20.000	0.000		ug/L
Pd	105	2950.30	303.391	2646.913		ug/L
Sn	118	980.03	723.365	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	464279.82	464279.816	461878.702		ug/L
As	75	23905.66	0.067	-7157.058	**23.41191**	ug/L
Cl	35	220146248.59	10791373.695	209354874.897		ug/L
Kr	83	43.00	6.667	36.333		ug/L
Ru	99	10.00	10.000	0.000		ug/L
Pd	105	2980.31	333.397	2646.913		ug/L
Sn	118	1120.04	863.375	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		100.664
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W917018-MSD1
Sample Date/Time: Tuesday, April 28, 2009 10:16:50
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W917018-MSD1.020
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	421556.56	421556.559			ug/L
[	As	75	23507.88	0.074	**25.7266**	21.102	ug/L
	Cl	35	S	S			ug/L
	Kr	83	47.22	10.889			ug/L
	Ru	99	15.00	15.000			ug/L
	Pd	105	2543.57	-103.347			ug/L
	Sn	118	1010.04	753.367			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	311182.70	311182.698	461878.702		ug/L
As	75	23664.88	0.092	-7157.058	**31.99527**	ug/L
Cl	35	S	S	209354874.897		ug/L
Kr	83	53.67	17.333	36.333		ug/L
Ru	99	15.00	15.000	0.000		ug/L
Pd	105	2030.14	-616.769	2646.913		ug/L
Sn	118	1070.04	813.371	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	478437.64	478437.643	461878.702		ug/L
As	75	23523.50	0.065	-7157.058	**22.60019**	ug/L
Cl	35	214516450.41	5161575.510	209354874.897		ug/L
Kr	83	41.67	5.333	36.333		ug/L
Ru	99	30.00	30.000	0.000		ug/L
Pd	105	3080.33	433.419	2646.913		ug/L
Sn	118	970.03	713.364	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	475049.34	475049.337	461878.702		ug/L
As	75	23335.25	0.065	-7157.058	**22.58426**	ug/L
Cl	35	218605286.05	9250411.148	209354874.897		ug/L
Kr	83	46.33	10.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2520.22	-126.691	2646.913		ug/L
Sn	118	990.03	733.365	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
[>	Ga	71		91.270
[	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W9D0297-02
Sample Date/Time: Tuesday, April 28, 2009 10:18:44
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W9D0297-02.021
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	460384.86	460384.865			ug/L
	As	75	27070.04	0.074	**25.9669**	1.207	ug/L
	Cl	35	215532632.69	6177757.791			ug/L
	Kr	83	43.11	6.778			ug/L
	Ru	99	0.00	0.000			ug/L
	Pd	105	2700.26	53.343			ug/L
	Sn	118	1320.06	1063.393			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	462916.63	462916.632	461878.702		ug/L
As	75	27050.19	0.074	-7157.058	**25.83906**	ug/L
Cl	35	218755488.17	9400613.274	209354874.897		ug/L
Kr	83	43.67	7.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2940.30	293.389	2646.913		ug/L
Sn	118	1230.05	973.384	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	458976.51	458976.510	461878.702		ug/L
As	75	27456.73	0.075	-7157.058	**26.32397**	ug/L
Cl	35	212791907.48	3437032.588	209354874.897		ug/L
Kr	83	46.00	9.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2660.25	13.334	2646.913		ug/L
Sn	118	1600.09	1343.421	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	459261.45	459261.452	461878.702		ug/L
As	75	26703.20	0.074	-7157.058	**25.73754**	ug/L
Cl	35	215050502.41	5695627.512	209354874.897		ug/L
Kr	83	39.67	3.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2500.22	-146.695	2646.913		ug/L
Sn	118	1130.04	873.376	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		99.677
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W9D0297-03
Sample Date/Time: Tuesday, April 28, 2009 10:20:37
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W9D0297-03.022
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	461478.59	461478.588			ug/L
[	As	75	43443.29	0.110	**38.3224**	1.395	ug/L
	Cl	35	215689325.03	6334450.132			ug/L
	Kr	83	42.89	6.556			ug/L
	Ru	99	1.67	1.667			ug/L
	Pd	105	2946.97	300.058			ug/L
	Sn	118	1733.44	1476.770			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	463536.24	463536.245	461878.702		ug/L
As	75	43128.94	0.109	-7157.058	**37.93521**	ug/L
Cl	35	217164458.25	7809583.352	209354874.897		ug/L
Kr	83	45.33	9.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	3160.35	513.436	2646.913		ug/L
Sn	118	1760.11	1503.439	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	455082.87	455082.871	461878.702		ug/L
As	75	43640.92	0.111	-7157.058	**38.93247**	ug/L
Cl	35	213640271.34	4285396.445	209354874.897		ug/L
Kr	83	47.00	10.667	36.333		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2720.26	73.346	2646.913		ug/L
Sn	118	1780.11	1523.442	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	465816.65	465816.649	461878.702		ug/L
As	75	43560.02	0.109	-7157.058	**38.09944**	ug/L
Cl	35	216263245.50	6908370.599	209354874.897		ug/L
Kr	83	36.33	-0.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2960.31	313.393	2646.913		ug/L
Sn	118	1660.10	1403.427	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		99.913
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W9D0297-04
Sample Date/Time: Tuesday, April 28, 2009 10:22:30
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W9D0297-04.023
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	462354.88	462354.882			ug/L
	As	75	56108.24	0.137	**47.8299**	0.405	ug/L
	Cl	35	221172629.78	11817754.886			ug/L
	Kr	83	40.11	3.778			ug/L
	Ru	99	3.33	3.333			ug/L
	Pd	105	2933.64	286.723			ug/L
	Sn	118	2056.82	1800.147			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	462778.26	462778.255	461878.702		ug/L
As	75	55866.07	0.136	-7157.058	**47.60804**	ug/L
Cl	35	220290887.68	10936012.779	209354874.897		ug/L
Kr	83	38.00	1.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	3060.33	413.414	2646.913		ug/L
Sn	118	2030.14	1773.475	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	461582.49	461582.488	461878.702		ug/L
As	75	56194.59	0.137	-7157.058	**47.96609**	ug/L
Cl	35	221297798.22	11942923.324	209354874.897		ug/L
Kr	83	42.33	6.000	36.333		ug/L
Ru	99	10.00	10.000	0.000		ug/L
Pd	105	2600.24	-46.677	2646.913		ug/L
Sn	118	2260.18	2003.510	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	462703.90	462703.904	461878.702		ug/L
As	75	56264.07	0.137	-7157.058	**47.91546**	ug/L
Cl	35	221929203.45	12574328.555	209354874.897		ug/L
Kr	83	40.00	3.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	3140.35	493.432	2646.913		ug/L
Sn	118	1880.12	1623.455	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		100.103
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W9D0297-05
Sample Date/Time: Tuesday, April 28, 2009 10:24:24
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W9D0297-05.024
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	461499.45	461499.449			ug/L
	As	75	71565.68	0.171	**59.6159**	0.434	ug/L
	Cl	35	219287685.83	9932810.928			ug/L
	Kr	83	46.44	10.111			ug/L
	Ru	99	3.33	3.333			ug/L
	Pd	105	2943.64	296.724			ug/L
	Sn	118	1533.42	1276.747			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	459162.34	459162.341	461878.702		ug/L
As	75	71322.88	0.171	-7157.058	**59.70582**	ug/L
Cl	35	217542745.08	8187870.186	209354874.897		ug/L
Kr	83	40.00	3.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2700.26	53.342	2646.913		ug/L
Sn	118	1620.09	1363.423	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	465316.75	465316.747	461878.702		ug/L
As	75	71771.14	0.170	-7157.058	**59.32446**	ug/L
Cl	35	221492504.68	12137629.783	209354874.897		ug/L
Kr	83	47.67	11.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	3150.35	503.434	2646.913		ug/L
Sn	118	1530.08	1273.413	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	460019.26	460019.258	461878.702		ug/L
As	75	71603.02	0.171	-7157.058	**59.81753**	ug/L
Cl	35	218827807.71	9472932.816	209354874.897		ug/L
Kr	83	51.67	15.333	36.333		ug/L
Ru	99	10.00	10.000	0.000		ug/L
Pd	105	2980.31	333.397	2646.913		ug/L
Sn	118	1450.07	1193.405	256.669		ug/L

QC Calculated Values

200

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		99.918
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: CCV
Sample Date/Time: Tuesday, April 28, 2009 10:26:18
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\CCV.025
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	463034.27	463034.272			ug/L
	As	75	59858.03	0.145	**50.6027**	0.900	ug/L
	Cl	35	211318628.61	1963753.715			ug/L
	Kr	83	46.89	10.556			ug/L
	Ru	99	46.67	46.667			ug/L
	Pd	105	2596.90	-50.010			ug/L
	Sn	118	183.33	-73.334			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	468080.88	468080.883	461878.702		ug/L
As	75	59993.10	0.144	-7157.058	**50.21165**	ug/L
Cl	35	212608327.11	3253452.212	209354874.897		ug/L
Kr	83	47.67	11.333	36.333		ug/L
Ru	99	65.00	65.000	0.000		ug/L
Pd	105	2520.22	-126.691	2646.913		ug/L
Sn	118	210.00	-46.667	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	466609.92	466609.917	461878.702		ug/L
As	75	60181.13	0.144	-7157.058	**50.49371**	ug/L
Cl	35	210374765.87	1019890.976	209354874.897		ug/L
Kr	83	48.33	12.000	36.333		ug/L
Ru	99	40.00	40.000	0.000		ug/L
Pd	105	2730.26	83.348	2646.913		ug/L
Sn	118	170.00	-86.668	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	454412.02	454412.015	461878.702		ug/L
As	75	59399.87	0.146	-7157.058	**51.10285**	ug/L
Cl	35	210972792.85	1617917.957	209354874.897		ug/L
Kr	83	44.67	8.333	36.333		ug/L
Ru	99	35.00	35.000	0.000		ug/L
Pd	105	2540.23	-106.688	2646.913		ug/L
Sn	118	170.00	-86.668	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		100.250
	As	75	101.205	
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: CCB
Sample Date/Time: Tuesday, April 28, 2009 10:28:12
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\CCB.026
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	459332.84	459332.839			ug/L
[	As	75	-6857.30	0.001	**0.1999**	170.739	ug/L
	Cl	35	209866674.73	511799.835			ug/L
	Kr	83	36.67	0.333			ug/L
	Ru	99	0.00	0.000			ug/L
	Pd	105	2263.51	-383.401			ug/L
	Sn	118	256.67	-0.000			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	471070.79	471070.792	461878.702		ug/L
As	75	-7345.62	-0.000	-7157.058	**-0.03422**	ug/L
Cl	35	210719674.46	1364799.560	209354874.897		ug/L
Kr	83	34.00	-2.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2240.18	-406.738	2646.913		ug/L
Sn	118	220.00	-36.667	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	456321.46	456321.455	461878.702		ug/L
As	75	-6298.58	0.002	-7157.058	**0.59157**	ug/L
Cl	35	209949193.18	594318.287	209354874.897		ug/L
Kr	83	39.67	3.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2290.18	-356.730	2646.913		ug/L
Sn	118	260.00	3.333	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	450606.27	450606.271	461878.702		ug/L
As	75	-6927.71	0.000	-7157.058	**0.04241**	ug/L
Cl	35	208931156.56	-423718.342	209354874.897		ug/L
Kr	83	36.33	-0.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2260.18	-386.735	2646.913		ug/L
Sn	118	290.00	33.334	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		99.449
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W9D0297-06
Sample Date/Time: Tuesday, April 28, 2009 10:30:07
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W9D0297-06.027
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	466474.40	466474.401			ug/L
[	As	75	78241.78	0.183	**64.0424**	0.901	ug/L
	Cl	35	223723284.40	14368409.498			ug/L
	Kr	83	45.67	9.333			ug/L
	Ru	99	0.00	0.000			ug/L
	Pd	105	2736.93	90.016			ug/L
	Sn	118	1973.47	1716.801			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	472817.08	472817.084	461878.702		ug/L
As	75	78464.48	0.181	-7157.058	**63.41705**	ug/L
Cl	35	227244689.78	17889814.885	209354874.897		ug/L
Kr	83	42.33	6.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2780.27	133.357	2646.913		ug/L
Sn	118	1950.13	1693.464	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	465742.28	465742.283	461878.702		ug/L
As	75	78804.99	0.185	-7157.058	**64.55364**	ug/L
Cl	35	221180974.35	11826099.448	209354874.897		ug/L
Kr	83	46.00	9.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2730.26	83.348	2646.913		ug/L
Sn	118	2150.16	1893.493	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	460863.84	460863.835	461878.702		ug/L
As	75	77455.88	0.184	-7157.058	**64.15650**	ug/L
Cl	35	222744189.06	13389314.162	209354874.897		ug/L
Kr	83	48.67	12.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2700.26	53.342	2646.913		ug/L
Sn	118	1820.12	1563.447	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		100.995
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W9D0297-07
Sample Date/Time: Tuesday, April 28, 2009 10:32:00
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W9D0297-07.028
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	462694.92	462694.917			ug/L
[	As	75	78799.04	0.186	**64.9461**	1.509	ug/L
	Cl	35	225211398.05	15856523.149			ug/L
	Kr	83	45.44	9.111			ug/L
	Ru	99	1.67	1.667			ug/L
	Pd	105	2746.93	100.018			ug/L
	Sn	118	1996.81	1740.138			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	468832.95	468832.952	461878.702		ug/L
As	75	78337.08	0.183	-7157.058	**63.81497**	ug/L
Cl	35	222741407.54	13386532.641	209354874.897		ug/L
Kr	83	51.67	15.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2650.25	3.332	2646.913		ug/L
Sn	118	1980.14	1723.468	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	459331.66	459331.656	461878.702		ug/L
As	75	79019.28	0.188	-7157.058	**65.54205**	ug/L
Cl	35	226833024.70	17478149.800	209354874.897		ug/L
Kr	83	47.33	11.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2740.26	93.349	2646.913		ug/L
Sn	118	1870.12	1613.453	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	459920.14	459920.142	461878.702		ug/L
As	75	79040.74	0.187	-7157.058	**65.48142**	ug/L
Cl	35	226059761.90	16704887.006	209354874.897		ug/L
Kr	83	37.33	1.000	36.333		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2850.28	203.371	2646.913		ug/L
Sn	118	2140.16	1883.491	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		100.177
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W9D0297-08
Sample Date/Time: Tuesday, April 28, 2009 10:33:54
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W9D0297-08.029
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	460174.30	460174.295			ug/L
	As	75	107437.80	0.249	**87.0181**	1.102	ug/L
	Cl	35	224855363.38	15500488.481			ug/L
	Kr	83	42.22	5.889			ug/L
	Ru	99	1.67	1.667			ug/L
	Pd	105	2700.26	53.342			ug/L
	Sn	118	2813.61	2556.941			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	463205.78	463205.781	461878.702		ug/L
As	75	107131.83	0.247	-7157.058	**86.25125**	ug/L
Cl	35	226899781.20	17544906.300	209354874.897		ug/L
Kr	83	45.67	9.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2650.25	3.332	2646.913		ug/L
Sn	118	2810.28	2553.607	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	458028.81	458028.811	461878.702		ug/L
As	75	106535.25	0.248	-7157.058	**86.70969**	ug/L
Cl	35	225842803.28	16487928.380	209354874.897		ug/L
Kr	83	44.00	7.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2830.28	183.367	2646.913		ug/L
Sn	118	2830.28	2573.611	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	459288.29	459288.294	461878.702		ug/L
As	75	108646.32	0.252	-7157.058	**88.09324**	ug/L
Cl	35	221823505.66	12468630.763	209354874.897		ug/L
Kr	83	37.00	0.667	36.333		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2620.24	-26.673	2646.913		ug/L
Sn	118	2800.27	2543.605	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		99.631
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W9D0297-09
Sample Date/Time: Tuesday, April 28, 2009 10:35:47
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W9D0297-09.030
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	469309.32	469309.321			ug/L
	As	75	347099.93	0.755	**263.9258**	0.984	ug/L
	Cl	35	224416810.26	15061935.362			ug/L
	Kr	83	46.89	10.556			ug/L
	Ru	99	3.33	3.333			ug/L
	Pd	105	3003.65	356.736			ug/L
	Sn	118	1436.74	1180.071			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	474404.43	474404.429	461878.702		ug/L
As	75	347047.40	0.747	-7157.058	**261.09615**	ug/L
Cl	35	226204400.99	16849526.090	209354874.897		ug/L
Kr	83	51.67	15.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2840.28	193.369	2646.913		ug/L
Sn	118	1500.08	1243.410	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	467273.07	467273.073	461878.702		ug/L
As	75	348656.27	0.762	-7157.058	**266.20164**	ug/L
Cl	35	222246296.83	12891421.931	209354874.897		ug/L
Kr	83	48.00	11.667	36.333		ug/L
Ru	99	10.00	10.000	0.000		ug/L
Pd	105	3200.36	553.445	2646.913		ug/L
Sn	118	1580.09	1323.418	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	466250.46	466250.462	461878.702		ug/L
As	75	345596.10	0.757	-7157.058	**264.47967**	ug/L
Cl	35	224799732.96	15444858.064	209354874.897		ug/L
Kr	83	41.00	4.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2970.31	323.395	2646.913		ug/L
Sn	118	1230.05	973.384	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		101.609
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W9D0297-10
Sample Date/Time: Tuesday, April 28, 2009 10:37:41
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W9D0297-10.031
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	461146.10	461146.097			ug/L
[	As	75	38692.98	0.099	**34.7415**	1.188	ug/L
	Cl	35	213054297.62	3699422.720			ug/L
	Kr	83	43.67	7.333			ug/L
	Ru	99	1.67	1.667			ug/L
	Pd	105	2933.64	286.722			ug/L
	Sn	118	1520.08	1263.412			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	462592.38	462592.378	461878.702		ug/L
As	75	38977.46	0.100	-7157.058	**34.86494**	ug/L
Cl	35	214063062.51	4708187.613	209354874.897		ug/L
Kr	83	46.67	10.333	36.333		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2740.26	93.349	2646.913		ug/L
Sn	118	1640.09	1383.425	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	460417.79	460417.793	461878.702		ug/L
As	75	39075.60	0.100	-7157.058	**35.07852**	ug/L
Cl	35	214510887.37	5156012.468	209354874.897		ug/L
Kr	83	42.33	6.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	3150.35	503.434	2646.913		ug/L
Sn	118	1480.08	1223.408	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	460428.12	460428.118	461878.702		ug/L
As	75	38025.87	0.098	-7157.058	**34.28101**	ug/L
Cl	35	210588942.98	1234068.080	209354874.897		ug/L
Kr	83	42.00	5.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2910.30	263.383	2646.913		ug/L
Sn	118	1440.07	1183.404	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		99.841
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W9D0297-11
Sample Date/Time: Tuesday, April 28, 2009 10:39:34
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\W9D0297-11.032
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	455244.45	455244.450			ug/L
	As	75	48078.17	0.121	**42.3327**	1.796	ug/L
	Cl	35	211222202.56	1867327.659			ug/L
	Kr	83	42.00	5.667			ug/L
	Ru	99	3.33	3.333			ug/L
	Pd	105	2836.95	190.036			ug/L
	Sn	118	2036.81	1780.143			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	459009.55	459009.547	461878.702		ug/L
As	75	47834.74	0.120	-7157.058	**41.83908**	ug/L
Cl	35	212869790.07	3514915.171	209354874.897		ug/L
Kr	83	40.33	4.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2930.30	283.387	2646.913		ug/L
Sn	118	2030.14	1773.475	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	457122.46	457122.463	461878.702		ug/L
As	75	47783.95	0.120	-7157.058	**41.95061**	ug/L
Cl	35	212090964.23	2736089.335	209354874.897		ug/L
Kr	83	40.67	4.333	36.333		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2950.30	303.391	2646.913		ug/L
Sn	118	1980.14	1723.468	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	449601.34	449601.341	461878.702		ug/L
As	75	48615.84	0.124	-7157.058	**43.20847**	ug/L
Cl	35	208705853.37	-649021.530	209354874.897		ug/L
Kr	83	45.00	8.667	36.333		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2630.24	-16.671	2646.913		ug/L
Sn	118	2100.15	1843.485	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		98.564
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: CCV
Sample Date/Time: Tuesday, April 28, 2009 10:41:29
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\CCV.033
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	457882.14	457882.139			ug/L
	As	75	58197.19	0.143	**49.8428**	1.252	ug/L
	Cl	35	207377213.58	-1977661.319			ug/L
	Kr	83	43.89	7.556			ug/L
	Ru	99	28.33	28.333			ug/L
	Pd	105	2403.54	-243.377			ug/L
	Sn	118	246.67	-10.000			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	452170.55	452170.550	461878.702		ug/L
As	75	58396.89	0.145	-7157.058	**50.55406**	ug/L
Cl	35	210269068.08	914193.184	209354874.897		ug/L
Kr	83	47.00	10.667	36.333		ug/L
Ru	99	25.00	25.000	0.000		ug/L
Pd	105	2530.22	-116.689	2646.913		ug/L
Sn	118	180.00	-76.668	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	459360.56	459360.563	461878.702		ug/L
As	75	57791.73	0.141	-7157.058	**49.38711**	ug/L
Cl	35	205073187.15	-4281687.750	209354874.897		ug/L
Kr	83	43.00	6.667	36.333		ug/L
Ru	99	20.00	20.000	0.000		ug/L
Pd	105	2250.18	-396.736	2646.913		ug/L
Sn	118	210.00	-46.667	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	462115.30	462115.304	461878.702		ug/L
As	75	58402.95	0.142	-7157.058	**49.58727**	ug/L
Cl	35	206789385.51	-2565489.390	209354874.897		ug/L
Kr	83	41.67	5.333	36.333		ug/L
Ru	99	40.00	40.000	0.000		ug/L
Pd	105	2430.21	-216.707	2646.913		ug/L
Sn	118	350.00	93.335	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
[>	Ga	71		99.135
[	As	75	99.686	
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: CCB
Sample Date/Time: Tuesday, April 28, 2009 10:43:22
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118D\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118D\CCB.034
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	458601.72	458601.717			ug/L
[	As	75	-6667.14	0.001	**0.3301**	151.969	ug/L
	Cl	35	206666071.42	-2688803.481			ug/L
	Kr	83	35.44	-0.889			ug/L
	Ru	99	0.00	0.000			ug/L
	Pd	105	2400.20	-246.711			ug/L
	Sn	118	220.00	-36.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	462526.29	462526.289	461878.702		ug/L
As	75	-6519.59	0.001	-7157.058	**0.48929**	ug/L
Cl	35	206936806.11	-2418068.786	209354874.897		ug/L
Kr	83	33.00	-3.333	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2390.20	-256.713	2646.913		ug/L
Sn	118	240.00	-16.667	256.669		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	462257.81	462257.805	461878.702		ug/L
As	75	-6193.88	0.002	-7157.058	**0.73269**	ug/L
Cl	35	206597460.57	-2757414.328	209354874.897		ug/L
Kr	83	38.00	1.667	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2510.22	-136.693	2646.913		ug/L
Sn	118	210.00	-46.667	256.669		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	451021.06	451021.057	461878.702		ug/L
As	75	-7287.95	-0.001	-7157.058	**-0.23181**	ug/L
Cl	35	206463947.57	-2890927.329	209354874.897		ug/L
Kr	83	35.33	-1.000	36.333		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2300.19	-346.728	2646.913		ug/L
Sn	118	210.00	-46.667	256.669		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		99.291
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

SVL ANALYTICAL

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

ICP Color Sheet

Client: Golder Associates (AZ)

Batch	SDG Number	Case Number
W917039	9D0297	

Matrix: Solid **Prepared using: SOP 4079 (3010A)**

Lab Number	Client ID	pH <2	COLOR Before	COLOR After	CLARITY Before	CLARITY After	TEXTURE	ARTIFACT (Y/N) *	PREP wgt/vol
W917039-BLK1	Blank								
W917039-BS1	LCS								
W917039-MS1	Matrix Spike								
W917039-MSD1	MS Dup								
W9D0297-01	NMF-07HHF	yes	colorless	colorless	clear	clear	NA	N	5 ml
W9D0297-02	NMF-07HHF								
W9D0297-03	EMF-07HHF								
W9D0297-04	EMF-07HHF								
W9D0297-05	EMF-07HHF								
W9D0297-06	EMF-07HHF								
W9D0297-07	EMF-07HHF								
W9D0297-08	EMF-07HHF								
W9D0297-09	EMF-07HHF								
W9D0297-10	EMF-07HHF								
W9D0297-11	EMF-07HHF								

04/30/2009

COLOR : red, blue, yellow, green, orange, violet, white, colorless, brown, grey, black
CLARITY : clear, cloudy, opaque
TEXTURE : fine (powdery), medium (sand), coarse (large crystals or rocks)

* If artifacts are found, report "yes" and describe in the space below:

04/30/2009

W917039

Log/Preparation Bench Sheet

See Extraction Comments

W917039

Matrix: Solid

Prepared using: SOP 4079 (3010A)

Earliest Due: 04/29/09 Earliest Expiration: 09/29/09 08:50

ICP 4079

				Origin	Hold Time Expires	Home Location	Client	Due Date
W917039-BLK1	Blank		[50mL - 50mL]					
W917039-BS1	LCS		[50mL - 50mL]	Spike 1: 09B0088				
W917039-MS1	Matrix Spike [W9D0297-01]		[50mL - 50mL]	Spike 1: 09B0088				
W917039-MSD1	MS Dup [W9D0297-01]		[50mL - 50mL]	Spike 1: 09B0088				
W9D0297-01	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	NMF-07HHRA-005S1		[50mL - 50mL]	Arizona	30-Sep-09 11:15	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-02	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	NMF-07HHRA-005E1		[50mL - 50mL]	Arizona	30-Sep-09 11:00	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-03	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-002N1		[50mL - 50mL]	Arizona	29-Sep-09 08:50	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-04	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-002S1		[50mL - 50mL]	Arizona	29-Sep-09 08:55	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-05	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-004N1		[50mL - 50mL]	Arizona	29-Sep-09 10:50	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-06	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-004W1		[50mL - 50mL]	Arizona	29-Sep-09 10:55	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-07	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-003N1		[50mL - 50mL]	Arizona	29-Sep-09 13:20	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-08	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-003W1		[50mL - 50mL]	Arizona	29-Sep-09 13:15	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-09	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-005N1		[50mL - 50mL]	Arizona	29-Sep-09 15:20	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-10	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-005E1		[50mL - 50mL]	Arizona	29-Sep-09 15:45	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-11	**A 01** by SPLP 6010B	Cu Pb						29-Apr-09
ClientSample ID:	EMF-07HHRA-BFD2		[50mL - 50mL]	Arizona	30-Sep-09 12:30	WarmRoom 33 FL	Golder Associates (AZ)	

COPY

ORIGINAL BENCH SHEET

4/30/2009

Preparation Reagents

Standard	Description	Lot Number
08J0438	HCl, conc.	K2007

Standard	Description	Lot Number
09A0206	HNO3, conc.	K1408

Spike Standards

Standard	Description	Amount (µL)
09B0088	QC19115ScSn WATER DIG	500

Standard	Description	Amount (µL)

Digested By: DT Date/Time: 4/21/09 0900/1500 Instrument ID: ICP Optima ☐1 ☒5 ☐6 ☐7

Analyzed By: DT Date/Time: 4/27/09

Reviewed By: DJS Date: 04/27/2009 Data File(s): 09117A

Instrument operating conditions and parameters for this analytical batch are as stated in the Standard Operating Procedure for the analysis listed above unless otherwise noted.

Printed: 4/21/2009 10:00:24AM

W917018

Log/Preparation Bench Sheet

See Extraction Comments

W917018

Matrix: Solid

Prepared using: SOP 4079 (3010A) - ICPMS

Earliest Due: 04/29/09 Earliest Expiration: 09/29/09 08:50

MS 4079 22°

			Origin	Hold Time Expires	Home Location	Client	Due Date
W917018-BLK1	Blank	[50mL - 50mL]					
W917018-BS1	LCS	[50mL - 50mL]	Spike 1: 09D0031				
W917018-MS1	Matrix Spike [W9D0297-01]	[50mL - 50mL]	Spike 1: 09D0031				
W917018-MSD1	MS Dup [W9D0297-01]	[50mL - 50mL]	Spike 1: 09D0031				
W9D0297-01	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	NMF-07HHRA-005S1	[50mL - 50mL]	Arizona	30-Sep-09 11:15	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-02	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	NMF-07HHRA-005E1	[50mL - 50mL]	Arizona	30-Sep-09 11:00	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-03	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-002N1	[50mL - 50mL]	Arizona	29-Sep-09 08:50	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-04	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-002S1	[50mL - 50mL]	Arizona	29-Sep-09 08:55	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-05	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-004N1	[50mL - 50mL]	Arizona	29-Sep-09 10:50	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-06	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-004W1	[50mL - 50mL]	Arizona	29-Sep-09 10:55	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-07	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-003N1	[50mL - 50mL]	Arizona	29-Sep-09 13:20	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-08	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-003W1	[50mL - 50mL]	Arizona	29-Sep-09 13:15	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-09	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-005N1	[50mL - 50mL]	Arizona	29-Sep-09 15:20	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-10	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-005E1	[50mL - 50mL]	Arizona	29-Sep-09 15:45	WarmRoom 33 FL	Golder Associates (AZ)	
W9D0297-11	**A 01** by SPLP 6020 As						29-Apr-09
ClientSample ID:	EMF-07HHRA-BFD2	[50mL - 50mL]	Arizona	30-Sep-09 12:30	WarmRoom 33 FL	Golder Associates (AZ)	

COPY
ORIGINAL IS BENCH SHEET

04/30/2009

Preparation Reagents

Standard	Description	Lot Number
08J0438	HCl, conc.	K2007

Standard	Description	Lot Number
09A0206	HNO3, conc.	K1408

Spike Standards

Standard	Description	Amount (µL)
09D0031	F-26+U	500

Standard	Description	Amount (µL)

Digested By: JP Date/Time: 4/20/09 1500/2100 Instrument ID: PE ICPMS DRC-E

Analyzed By: [signature] Date/Time: 4/28/09

Reviewed By: [signature] Date: 04/29/2009 Data File(s): 1180

Instrument operating conditions and parameters for this analytical batch are as stated in

WADO297

From: Origin ID: TUSA (520) 888-8818
Administrative Assistant
Golder Associates Inc
4730 North Oracle Rd
Suite 210
Tucson, AZ 85705

FedEx Express

J9011090130282J

Ship Date: 14APR09
ActWgt: 62.0 LB
CAD: 7386486/INET9011
Account#: S *********

224

Delivery Address Bar Code

Ref # 07392519.2
Invoice #
PO #
Dept #

SHIP TO: (208) 784-1258 BILL SENDER

Kirby Gray
SVL Analytical
One Government Gulch

Kellogg, ID 83837

TRK# 0201 7975 0719 5140

WED - 15APR PM
PRIORITY OVERNIGHT

X3 COEA

83837
ID-US
GEG

Cooler 1
5.2°

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic valueof the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

225

From: Origin ID: TUSA (520) 888-8818
Administrative Assistant
Golder Associates Inc
4730 North Oracle Rd
Suite 210
Tucson, AZ 85705

FedEx Express

E

J90110901302023

Ship Date: 14APR09
ActWgt: 54.0 LB
CAD: 7386486/INET9011
Account#: S *********

Delivery Address Bar Code

SHIP TO: (208) 784-1258 BILL SENDER

Kirby Gray
SVL Analytical
One Government Gulch

Kellogg, ID 83837

Ref # 07392519.2
Invoice #
PO #
Dept #

TRK# 0201 7975 0719 3515

WED - 15APR PM
PRIORITY OVERNIGHT

X3 COEA

83837
ID-US
GEG

Cooler 2
32°

After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

1480099

224

CHAIN OF CUSTODY RECORD

SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX: (208) 783-0891

FOR SVL USE ONLY
SVL JOB #

TEMP on Receipt: WADO 297

Report to Company: GOLDER ASSOCIATES INC.
Contact: ORESTES MORFIN
Address: 4730 N. ORACLE #210
TUCSON AZ 85705
Phone Number: 520-888-8818
FAX Number: -8817
E-mail: omorfin@golder.com

Invoice Sent To: SAME
Contact:
Address:
Phone Number:
FAX Number:
PO#:

Table 1. – Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other

RCML WHRA
Project Name: ANOMALOUS Pb SAMPLI
Sampler's Signature: Orestes Morfin

Indicate State of sample origination: AZ **USACE?** ☐ Yes ☐ No

	Sample ID (Please take care to distinguish between: 1 and I, 2 and Z, 5 and S, Ø and O. Thanks!)	Collection Date	Collection Time	Collected by: (Init.)	Misc. Matrix Type (From Table 1)	Misc. No. of Containers	Preservative(s) Unpreserved	HNO_3 Filtered	HNO_3 Unfiltered	HCl	H_2SO_4	NaOH	Other (Specify) ICE	Analyses Required: TOTAL METALS FOR As, Cu + Pb ON < 250 MICRON FRACTION	Analyses Required: SPLP FOR As, Cu + Pb ON BULK FRACTION	Analyses Required: See ATTACHED TABLE 1	Rush Instructions (Days)
1	NMF-ØTHHRA-ØØ5S1	4/3/09	1115	OM	3	1								✓	✓	
2	-ØØ5E1	"	1100	OM												
3	EMF-ØTHHRA-ØØ2N1	4/2/09	850													
4	-ØØ2S1		855													
5	-ØØ4N1		1050													
6	-ØØ4W1		1055													
7	-ØØ3N1		1320													
8	-ØØ3W1		1315													
9	-ØØ5N1		1520													
10	-ØØ5E1	↓	1545	↓	↓	↓							↓	↓	↓	

COOLER 1
COOLER 2

Comments
- STANDARD 20:1 RATIO FOR SPLP
- EPA LEVEL III REPORTING
- NORMAL T.A.T
- SPLIT SAMPLE, + SIEVE 1 SPLIT TO <250μm FOR TOTAL METALS ANALYSIS
- DELIVER RESULTS IN E-FORM & PDF TO GOLDER

Relinquished by: Orestes Morfin	Date: 4/14/09	Time: 1600	Received by: D. Strebleng	Date: 4/15/09	Time: 14:50
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: ☐ Return ☐ Dispose ☐ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SVL-COC 9/05

COPY

CHAIN OF CUSTODY RECORD

SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX: (208) 783-0891

FOR SVL USE ONLY
SVL JOB # W9D0297
TEMP on Receipt:

Table 1. – Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other_____

Report to Company: GOLDER ASSOCIATES INC.
Contact: ORESTES MORFIN
Address: 4730 N. ORACLE #210
TUCSON AZ. 85705
Phone Number: 520-888-8818
FAX Number: -8817
E-mail: omorfin@golder.com

Invoice Sent To: SAME
Contact:
Address:
Phone Number:
FAX Number:
PO#:

RCML HHRA
Project Name: ANOMALOUS Pb SAMPLIN
Sampler's Signature: Orestes Morfin

Indicate State of sample origination: AZ **USACE?** ☐ Yes ☐ No

	Sample ID	Collection			Misc.		Preservative(s)							Analyses Required										Rush Instructions (Days)	Comments
	Please take care to distinguish between: 1 and I, 2 and Z, 5 and S, Ø and O. Thanks!	Date	Time	Collected by: (Init.)	Matrix Type (From Table 1)	No. of Containers	Unpreserved	HNO_3 Filtered	HNO_3 Unfiltered	HCl	H_2SO_4	NaOH	Other (Specify) ICE	TOTAL METALS FOR As, Cu + Pb ON <250 µm FRACTION	SPLP FOR As, Cu + Pb BULK FRACTION	AQUEOUS ANALYSIS FOR Cu + As + Pb	SEE ATTACHED TABLE 1								
1	EMF-Ø7HHRA-BFD2	4/3/09	12³⁰	OM	3	1							✓	✓	✓										• STANDARD 20:1 RATIO FOR SPLP • EPA LEVEL III REPORTING • NORMAL T.A.T • SPLIT SAMPLE, + SIEVE 1 SPLIT TO <250µm FOR TOTAL METALS ANALYSIS
2	SIEVE DRB	"	17⁰⁰	OM	4	1			✓							✓									• DELIVER RESULTS IN E-FORM & PDF TO GOLDER
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									

Relinquished by: Orestes Morfin	Date: 4/4/09	Time: 16⁰⁰	Received by: R. Stribling	Date: 4/15/09	Time: 14:50
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: ☐ Return ☐ Dispose ☐ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SVL-COC 9/05

COPY

Table 1
Tier 2 Analytical Suite for RCML HHRA Solid Samples and Decontamination Rinseate Blanks

W9D0297

Constituent	Arizona Residential SRL (mg/kg)	Arizona Non-residential SRL (mg/kg)	Minimum GPL (mg/kg)	AWQS (mg/L)	Total Metals Analysis (<250 µm fraction)		Aqueous* Analysis	
					Analytical Method	PQL (mg/kg)	Analytical Method	PQL (mg/L)
Arsenic	10	10	290	0.05	EPA 6010 ICP	2.5	EPA 6020 ICP-MS	0.003
Copper	3,100	41,000	NS	NS	EPA 6010 ICP	1.0	EPA 6010 ICP	0.01
Lead	400	800	290	0.05	EPA 6010 ICP	0.75	EPA 6010 ICP	0.0075

Notes:
SRL = soil remediation level
GPL = groundwater protection level
AWQS = aquifer water quality standard
*Includes synthetic precipitation leaching procedure and decontamination rinseate blanks (DRBs)
PQL = practical quantitation limit
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
EPA = US Environmental Protection Agency
NS = no standard

COPY

SAMPLE LOG-IN SHEET

2 of 9

Lab Name	SVL ANALYTICAL
Received By (Print Name)	R. STRIBLING
Received By (Signature)	R. Stribling CRS
Case Number	
Sample Delivery Group No.	
Page 1 of 1	
Log-in Date	04/15/2009
NRAS Number	NA

Remarks:

1. Custody Seal(s) — Present/~~Absent~~* Intact/Broken
2. Custody Seal Nos. — NA
3. Traffic Reports/Chain of Custody Records or Packing Lists — Present/~~Absent~~*
4. Airbill — ~~Airbill~~/Sticker Present/~~Absent~~*
5. Airbill No. — 797507195140, 797507193515
6. Sample Tags — Present/~~Absent~~*
   Sample Tag Numbers — Listed/Not Listed on Chain of Custody Record
7. Sample Condition — ~~Intact~~/Broken*/Leaking
8. Cooler Temperature Indicator Bottle — Present/~~Absent~~*
9. Cooler Temperature — 5.2/3.2°C
10. Does information on Chain of Custody Records and sample tags agree? — Yes/No*
11. Date Received at Lab — 04/15/2009
12. Time Received — 14:50

EPA Sample #	Aqueous Sample pH	Corresponding: Sample Tag #	Corresponding: Assigned Lab #	Remarks: Condition of Sample Shipment, etc.
NMF-07HHRA-00551			NMF-07HHRA-00551	INTACT
NMF-07HHRA-005E1			NMF-07HHRA-005E1	
EMF-07HHRA-002N1			EMF-07HHRA-002N1	
EMF-07HHRA-00251			EMF-07HHRA-00251	
EMF-07HHRA-004N1			EMF-07HHRA-004N1	
EMF-07HHRA-004W1			EMF-07HHRA-004W1	
EMF-07HHRA-003N1			EMF-07HHRA-003N1	
EMF-07HHRA-003W1			EMF-07HHRA-003W1	
EMF-07HHRA-005N1			EMF-07HHRA-005N1	
EMF-07HHRA-005E1			EMF-07HHRA-005E1	
EMF-07HHRA-BF02		04/15/2009 CRS	EMF-07HHRA-BF02	
				04/15/2009 CRS

Sample Transfer

Fraction	N/A	Fraction	N/A
Area #	N/A	Area #	N/A
By	N/A	By	N/A
On	N/A	On	N/A

* Contact SMO and attach record of resolution

Reviewed By	Kirby Lucy	N/A	Logbook No. N/A
Date	04/15/2009	N/A	Logbook Page No. N/A

Contract Laboratory Program

230

Sample Delivery Group (SDG) Cover Sheet

SDG Number: 9D0297

☐ ICP-AES Analysis

☐ ICP-MS Analysis

Laboratory Name: SVL ANALYTICAL

Laboratory Code: _____

Contract No.: _____

Case No.: _____

Analysis Price: _____

SDG Turnaround: _____

Modified Analysis (if applicable):

Modification Reference No.: _____

USEPA Sample Numbers in SDG (Listed in Numerical Order)

1) NMF-07HHRA-00551	7) EMF-07HHRA-003N1	13)	19)
2) NMF-07HHRA-005E1	8) EMF-07HHRA-003W1	14)	20)
3) EMF-07HHRA-002N1	9) EMF-07HHRA-005N1	15)	21)
4) EMF-07HHRA-002S1	10) EMF-07HHRA-005E1	16)	22)
5) EMF-07HHRA-004N1	11) EMF-07HHRA-BFD2	17)	23)
6) EMF-07HHRA-004W1	12)	18)	24)

NMF-07HHRA-00551
First Sample in SDG

EMF-07HHRA-BFD2
Last Sample in SDG

04/15/2009
First Sample Receipt Date

04/15/2009
Last Sample Receipt Date

Note: There are a maximum of 20 field samples (excluding PE samples) in an SDG. Attach the TR/COC Records to this form in alphanumeric order (the order listed above on this form).

Signature: _____ Date: 04/15/2009

231

SAMPLE RECEIPT/CHAIN-OF -CUSTODY CHECKLIST

The following items were checked for completeness, correctness, and compliance to project specifications using the Chain-of-Custody (COC) and other supporting information.

Date of acceptance 2/15/2009 By: CRS ey

SVL Work No: W9D0297

Item	Description	V	VC	NV	NA	Comments
1	Client or project name	✓				Golder
2	Date and time of receipt at lab	✓				2/15/09 12:50
3	Received by	✓				ROBIN STRIBLING
4	Temperature blank or cooler temperature	✓				Temp. 5.2° °C., 3.2° Two coolers
5	Were the sample(s) received on ice	✓				yes
6	Custody tape/bottle seals	✓				NO
7	Condition of samples upon receipt (leaking; bubbles in VOA vials	✓				Good
8	Sample numbers/IDs agree with COC	✓				
9	Sample date & time agree with COC	✓				
10	Number of containers for each sample	✓				
11	The correct preservative for the analysis requested	✓				HNO3 bottle checked and <2
12	Did an SVL employee preserve sample(s) upon receipt				✓	
12	Type of container for each sample / volume received	✓				
13	Analysis requested for each sample	✓				
14	Sample matrix description	✓				
15	COC properly completed & legible	✓				
16	Corrections properly made (initials & date)				✓	
17	Additional comments or records of sample condition or treatment (unlisted or missing samples at laboratory, aliquot taken, sample hold, samples subcontracted, communications between client and laboratory)				✓	
18	Shipper's air bill	✓				

V- Verified VC- Verified Corrections Made NV-Not Verified NA- Not Applicable

Additional Comments: _____

Analytical Run Log
ICP-OES

Data File: 09117A.csv

232

Sample ID	Date	Time	Job Number	Instrument	Analyst
Calib Blank 1	04/27/2009	7:16:05 AM			DT
STD1	04/27/2009	7:21:50 AM			DT
STD2	04/27/2009	7:28:33 AM			DT
STD3	04/27/2009	7:33:21 AM			DT
STD4	04/27/2009	7:38:40 AM			DT
STD5	04/27/2009	7:43:07 AM			DT
ICV	04/27/2009	7:47:30 AM			DT
ICB	04/27/2009	7:53:28 AM			DT
CRI	04/27/2009	7:59:10 AM			DT
ICSA	04/27/2009	8:04:56 AM			DT
ICSAB	04/27/2009	8:11:15 AM			DT
CCV	04/27/2009	8:17:31 AM			DT
CCB	04/27/2009	8:23:30 AM			DT
ZZZZZZ	04/27/2009	8:41:04 AM			DT
ZZZZZZ	04/27/2009	8:46:56 AM			DT
ZZZZZZ	04/27/2009	8:52:05 AM			DT
ZZZZZZ	04/27/2009	8:57:15 AM	W917144	OPT5	DT
ZZZZZZ	04/27/2009	9:03:02 AM	W917144	OPT5	DT
ZZZZZZ	04/27/2009	9:09:08 AM	W917144	OPT5	DT
ZZZZZZ	04/27/2009	9:14:54 AM	W917144	OPT5	DT
ZZZZZZ	04/27/2009	9:20:39 AM	W917144	OPT5	DT
ZZZZZZ	04/27/2009	9:26:23 AM	W917144	OPT5	DT
ZZZZZZ	04/27/2009	9:32:25 AM	W917144	OPT5	DT
CCV	04/27/2009	9:38:32 AM			DT
CCB	04/27/2009	9:44:33 AM			DT
ZZZZZZ	04/27/2009	10:04:07 AM			DT
ZZZZZZ	04/27/2009	10:09:53 AM			DT
ZZZZZZ	04/27/2009	10:15:50 AM	W916298	OPT5	DT
ZZZZZZ	04/27/2009	10:21:36 AM	W916298	OPT5	DT
ZZZZZZ	04/27/2009	10:27:20 AM	W916298	OPT5	DT
ZZZZZZ	04/27/2009	10:33:29 AM	W916298	OPT5	DT
ZZZZZZ	04/27/2009	10:39:17 AM	W916298	OPT5	DT
ZZZZZZ	04/27/2009	10:45:01 AM	W916298	OPT5	DT
ZZZZZZ	04/27/2009	10:51:10 AM	W916298	OPT5	DT
ZZZZZZ	04/27/2009	10:57:20 AM	W916298	OPT5	DT
CCV	04/27/2009	11:03:18 AM			DT
CCB	04/27/2009	11:09:22 AM			DT
ZZZZZZ	04/27/2009	11:15:08 AM	W916298	OPT5	DT
CCV	04/27/2009	11:21:21 AM			DT
CCB	04/27/2009	11:27:20 AM			DT
W917039-BLK1	04/27/2009	11:46:10 AM			DT
W917039-BS1	04/27/2009	11:51:57 AM			DT
W9D0297-01	04/27/2009	11:57:54 AM	W917039	OPT5	DT
W917039-MS1	04/27/2009	12:03:41 PM	W917039	OPT5	DT
W917039-MSD1	04/27/2009	12:09:17 PM	W917039	OPT5	DT
W9D0297-02	04/27/2009	12:14:50 PM	W917039	OPT5	DT
W9D0297-03	04/27/2009	12:20:36 PM	W917039	OPT5	DT
W9D0297-04	04/27/2009	12:26:23 PM	W917039	OPT5	DT
W9D0297-05	04/27/2009	12:32:08 PM	W917039	OPT5	DT
W9D0297-06	04/27/2009	12:37:55 PM	W917039	OPT5	DT
CCV	04/27/2009	12:43:42 PM			DT

Analytical Run Log
ICP-OES

Data File: 09117A.csv

253

CCB	04/27/2009	12:49:43 PM			DT
W9D0297-07	04/27/2009	12:55:26 PM	W917039	OPT5	DT
W9D0297-08	04/27/2009	1:01:13 PM	W917039	OPT5	DT
W9D0297-09	04/27/2009	1:06:59 PM	W917039	OPT5	DT
W9D0297-10	04/27/2009	1:12:45 PM	W917039	OPT5	DT
W9D0297-11	04/27/2009	1:18:31 PM	W917039	OPT5	DT
CCV	04/27/2009	1:24:18 PM			DT
CCB	04/27/2009	1:30:19 PM			DT

04/30/2009

Dataset Report

User Name: Kevin
Computer Name: 107-ICPMS
Dataset File Path: C:\Elandata\DataSet\118D\
Report Date/Time: Tuesday, April 28, 2009 10:45:37

The Dataset

Batch ID	Sample ID	Date and Time	Read Type	Samp. File Name	Description
	Cal Blank	09:40:55 Tue 28-Apr-09	Blank	Cal Blank.001	
	Cal Std 1	09:42:48 Tue 28-Apr-09	Standard #1	Cal Std 1.002	
	Cal Std 2	09:44:41 Tue 28-Apr-09	Standard #2	Cal Std 2.003	
	Cal Std 3	09:46:34 Tue 28-Apr-09	Standard #3	Cal Std 3.004	
	Cal Std 4	09:48:28 Tue 28-Apr-09	Standard #4	Cal Std 4.005	
	Cal Std 5	09:50:21 Tue 28-Apr-09	Standard #5	Cal Std 5.006	
	Cal Std 6	09:52:14 Tue 28-Apr-09	Standard #6	Cal Std 6.007	
	ICV	09:54:07 Tue 28-Apr-09	QC Std #1	ICV.008	
	ICB	09:56:01 Tue 28-Apr-09	QC Std #2	ICB.009	
	RCLS	09:57:54 Tue 28-Apr-09	QC Std #3	RCLS.010	
	ICSA	09:59:48 Tue 28-Apr-09	QC Std #4	ICSA.011	
	ICSAB	10:01:42 Tue 28-Apr-09	QC Std #5	ICSAB.012	
	CCV	10:03:35 Tue 28-Apr-09	QC Std #6	CCV.013	
	CCB	10:05:29 Tue 28-Apr-09	QC Std #7	CCB.014	
W917018	W917018-BLK1	10:07:23 Tue 28-Apr-09	Sample	W917018-BLK1.015	2.5
	W917018-BS1	10:09:17 Tue 28-Apr-09	Sample	W917018-BS1.016	2.5
	W9D0297-01	10:11:10 Tue 28-Apr-09	Sample	W9D0297-01.017	2.5
	W917018L1	10:13:03 Tue 28-Apr-09	Sample	W917018L1.018	12.5
	W917018-MS1	10:14:57 Tue 28-Apr-09	Sample	W917018-MS1.019	2.5
	W917018-MSD1	10:16:50 Tue 28-Apr-09	Sample	W917018-MSD1.020	2.5
	W9D0297-02	10:18:44 Tue 28-Apr-09	Sample	W9D0297-02.021	2.5
	W9D0297-03	10:20:37 Tue 28-Apr-09	Sample	W9D0297-03.022	2.5
	W9D0297-04	10:22:30 Tue 28-Apr-09	Sample	W9D0297-04.023	2.5
	W9D0297-05	10:24:24 Tue 28-Apr-09	Sample	W9D0297-05.024	2.5
	CCV	10:26:18 Tue 28-Apr-09	QC Std #6	CCV.025	
	CCB	10:28:12 Tue 28-Apr-09	QC Std #7	CCB.026	
	W9D0297-06	10:30:07 Tue 28-Apr-09	Sample	W9D0297-06.027	2.5
	W9D0297-07	10:32:00 Tue 28-Apr-09	Sample	W9D0297-07.028	2.5
	W9D0297-08	10:33:54 Tue 28-Apr-09	Sample	W9D0297-08.029	2.5
	W9D0297-09	10:35:47 Tue 28-Apr-09	Sample	W9D0297-09.030	2.5
	W9D0297-10	10:37:41 Tue 28-Apr-09	Sample	W9D0297-10.031	2.5
	W9D0297-11	10:39:34 Tue 28-Apr-09	Sample	W9D0297-11.032	2.5
	CCV	10:41:29 Tue 28-Apr-09	QC Std #6	CCV.033	
	CCB	10:43:22 Tue 28-Apr-09	QC Std #7	CCB.034	

SVL ANALYTICAL

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

235

Sample Receipt Confirmation

Work Order
W9D0297

Date Due: 29-Apr-09 (10 day TAT)
Received: 15-Apr-09 14:50

Client: **Golder Associates (AZ)**
Project: **HHRA (L3)**

Project Manager: **Christine Meyer**

Report To:
Golder Associates (AZ)
Orestes Morfin
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705
Phone: 520-888-8818
Fax: 520-888-8817

Invoice To:
Golder Associates (AZ)
Orestes Morfin
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705
Phone: 520-888-8818
Fax: 520-888-8817

Cooler information for **1** Temp: 5.2°C Q6: Cooler temp outside 0-6° **No**
Custody Seals **No** Containers Intact **Yes** COC/Labels Agree **Yes** Preservation Confirmed **No** Received On Ice **Yes**

Cooler information for **2** Temp: 3.2°C Q6: Cooler temp outside 0-6° **No**
Custody Seals **No** Containers Intact **Yes** COC/Labels Agree **Yes** Preservation Confirmed **Yes** Received On Ice **Yes**

Container Comments

W9D0297-01	A	Bag, Ziploc	ARCHIVE
W9D0297-02	A	Bag, Ziploc	ARCHIVE
W9D0297-03	A	Bag, Ziploc	ARCHIVE
W9D0297-04	A	Bag, Ziploc	ARCHIVE
W9D0297-05	A	Bag, Ziploc	ARCHIVE
W9D0297-06	A	Bag, Ziploc	ARCHIVE
W9D0297-07	A	Bag, Ziploc	ARCHIVE
W9D0297-08	A	Bag, Ziploc	ARCHIVE
W9D0297-09	A	Bag, Ziploc	ARCHIVE
W9D0297-10	A	Bag, Ziploc	ARCHIVE
W9D0297-11	A	Bag, Ziploc	ARCHIVE

Sample information and analyses assigned	Comments	Removed Analyte
W9D0297-01 **NMF-07HHRA-005S1 [Soil] 03-Apr-09 11:15 Pacific** Golder - HHRA SPLP (Level 3)		
W9D0297-02 **NMF-07HHRA-005E1 [Soil] 03-Apr-09 11:00 Pacific** Golder - HHRA SPLP (Level 3)		
W9D0297-03 **EMF-07HHRA-002N1 [Soil] 02-Apr-09 08:50 Pacific** Golder - HHRA SPLP (Level 3)		
W9D0297-04 **EMF-07HHRA-002S1 [Soil] 02-Apr-09 08:55 Pacific** Golder - HHRA SPLP (Level 3)		
W9D0297-05 **EMF-07HHRA-004N1 [Soil] 02-Apr-09 10:50 Pacific** Golder - HHRA SPLP (Level 3)		
W9D0297-06 **EMF-07HHRA-004W1 [Soil] 02-Apr-09 10:55 Pacific** Golder - HHRA SPLP (Level 3)		
W9D0297-07 **EMF-07HHRA-003N1 [Soil] 02-Apr-09 13:20 Pacific** Golder - HHRA SPLP (Level 3)		
W9D0297-08 **EMF-07HHRA-003W1 [Soil] 02-Apr-09 13:15 Pacific** Golder - HHRA SPLP (Level 3)		
W9D0297-09 **EMF-07HHRA-005N1 [Soil] 02-Apr-09 15:20 Pacific** Golder - HHRA SPLP (Level 3)		
W9D0297-10 **EMF-07HHRA-005E1 [Soil] 02-Apr-09 15:45 Pacific** Golder - HHRA SPLP (Level 3)		

Samples will be disposed 30 days from report date (45 for soils). Longer archiving must be requested.

SVL ANALYTICAL

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

2236

Sample Receipt Confirmation

Work Order
W9D0297

Date Due: 29-Apr-09 (10 day TAT)
Received: 15-Apr-09 14:50

Client: **Golder Associates (AZ)**
Project: **HHRA (L3)**

Project Manager: **Christine Meyer**

Report To:
Golder Associates (AZ)
Orestes Morfin
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705
Phone: 520-888-8818
Fax: 520-888-8817

Invoice To:
Golder Associates (AZ)
Orestes Morfin
4730 N Oracle Rd, Suite 210
Tucson, AZ 85705
Phone: 520-888-8818
Fax: 520-888-8817

Cooler information for **1** Temp: 5.2°C Q6: Cooler temp outside 0-6° **No**
Custody Seals **No** Containers Intact **Yes** COC/Labels Agree **Yes** Preservation Confirmed **No** Received On Ice **Yes**

Cooler information for **2** Temp: 3.2°C Q6: Cooler temp outside 0-6° **No**
Custody Seals **No** Containers Intact **Yes** COC/Labels Agree **Yes** Preservation Confirmed **Yes** Received On Ice **Yes**

Container Comments

W9D0297-01	A	Bag, Ziploc	ARCHIVE
W9D0297-02	A	Bag, Ziploc	ARCHIVE
W9D0297-03	A	Bag, Ziploc	ARCHIVE
W9D0297-04	A	Bag, Ziploc	ARCHIVE
W9D0297-05	A	Bag, Ziploc	ARCHIVE
W9D0297-06	A	Bag, Ziploc	ARCHIVE
W9D0297-07	A	Bag, Ziploc	ARCHIVE
W9D0297-08	A	Bag, Ziploc	ARCHIVE
W9D0297-09	A	Bag, Ziploc	ARCHIVE
W9D0297-10	A	Bag, Ziploc	ARCHIVE
W9D0297-11	A	Bag, Ziploc	ARCHIVE

Sample information and analyses assigned **Comments** **Removed Analyte**

W9D0297-11 **EMF-07HHRA-BFD2 [Soil] 03-Apr-09 12:30 Pacific**
Golder - HHRA SPLP (Level 3)

Analysis groups included in this work order

Golder - HHRA SPLP (Level 3)

SPLP 6010B Cu | SPLP 6010B Pb | SPLP 6020 As | SPLP Procedure

Solid samples will be analyzed on an as-received, wet-weight basis unless otherwise instructed.
Work Order Comments:
Copy/Relog from W9D0292.

Reviewed By

04/15/2009
Date

Samples will be disposed 30 days from report date (45 for soils). Longer archiving must be requested.

SVL ANALYTICAL

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

237

Sample Receipt Confirmation

Work Order
W9D0297

Date Due: 29-Apr-09 (10 day TAT)
Received: 15-Apr-09 14:50

Client: **Golder Associates (AZ)**
Project: **HHRA (L3)**

Project Manager: **Christine Meyer**

	W9D0297-01 NMF-07HHR A-005S1 Solid	W9D0297-02 NMF-07HHR A-005E1 Solid	W9D0297-03 EMF-07HHR A-002N1 Solid	W9D0297-04 EMF-07HHR A-002S1 Solid	W9D0297-05 EMF-07HHR A-004N1 Solid	W9D0297-06 EMF-07HHR A-004W1 Solid	W9D0297-07 EMF-07HHR A-003N1 Solid	W9D0297-08 EMF-07HHR A-003W1 Solid
SPLP Procedure	X	X	X	X	X	X	X	X
SPLP-pH	X	X	X	X	X	X	X	X
SPLP-Time	X	X	X	X	X	X	X	X
SPLP-Volume	X	X	X	X	X	X	X	X
SPLP-Weight	X	X	X	X	X	X	X	X
SPLP 6010B Cu	X	X	X	X	X	X	X	X
SPLP 6010B Pb	X	X	X	X	X	X	X	X
SPLP 6020 As	X	X	X	X	X	X	X	X

	W9D0297-09 EMF-07HHR A-005N1 Solid	W9D0297-10 EMF-07HHR A-005E1 Solid	W9D0297-11 EMF-07HHR A-BFD2 Solid
SPLP Procedure	X	X	X
SPLP-pH	X	X	X
SPLP-Time	X	X	X
SPLP-Volume	X	X	X
SPLP-Weight	X	X	X
SPLP 6010B Cu	X	X	X
SPLP 6010B Pb	X	X	X
SPLP 6020 As	X	X	X

Samples will be disposed 30 days from report date (45 for soils). Longer archiving must be requested.

GOLDER ASSOCIATES

PROJECT NAME: RCML HHRA ANOMALOUS Pb SAMPLING

SVL/SDG: W9D0298

SDG: W9D0298

NARRATIVE

GOLDER

Project Name: RCML HHRA ANOMALOUS Pb SAMPLING

SVL/SDG: W9D0298

Samples were received April 15, 2009.
Cooler temperatures were 5.2°C and 3.2°C

Samples were prepared as instructions indicated.

Analyzed for arsenic, copper and lead.

"D" Flag indicates dilution was required.

- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES

SDG No.: W9D0298 **Method Type:** **SOW No.:**

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
W916206-MS1	SIEVE DRBS	Matrix Spike
W916206-MSD1	SIEVE DRBSD	Matrix Spike Duplicate
W917173-MS1	SIEVE DRBS	Matrix Spike
W917173-MSD1	SIEVE DRBSD	Matrix Spike Duplicate
W9D0298-01	SIEVE DRB	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments: RCML HHRA ANOMALOUS Pb SAMPLING

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Kirby L. Gray Name: **KIRBY L. GRAY**

Date: 04/28/2009 Title: **TECHNICAL DIRECTOR**

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0298 **Method Type:**

Sample ID: W9D0298-01 **Client ID:** SIEVE DRB

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Date Received:** 04/15/2009 **Level:** LOW

% Solids: **Total/Dissolved:** TOTAL

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	1.2	ug/L	U	D	MS	1.2	PE ICPMS DRC-E	118E
7440-50-8	Copper	3.9	ug/L	U		P	3.9	OPTIMA6	W917173
7439-92-1	Lead	3.9	ug/L	U		P	3.9	OPTIMA6	W917173

Color Before: COLORLESS **Clarity Before:** CLEAR **Texture:**

Color After: COLORLESS **Clarity After:** CLEAR **Artifacts:**

Comments:

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: GOLDER ASSOCIATES **SDG No.:** W9D0298

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Initial Calibration Source: 09C0298 / 09D0236 KS 04/28/09

Continuing Calibration Source: 09C0299 / 09D0236 KS 04/28/09

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV									
	Arsenic	25.93	25.0	104	90.0 - 110.0	MS	04/28/2009	11:02	118E
CCV									
	Arsenic	48.67	50.0	97	90.0 - 110.0	MS	04/28/2009	11:12	118E
CCV									
	Arsenic	49.16	50.0	98	90.0 - 110.0	MS	04/28/2009	11:27	118E
ICV									
	Copper	1985.46	2000.0	99	90.0 - 110.0	P	04/27/2009	15:15	W917173
	Lead	2039.77	2000.0	102	90.0 - 110.0	P	04/27/2009	15:15	W917173
CCV									
	Copper	1965.21	2000.0	98	90.0 - 110.0	P	04/27/2009	15:44	W917173
	Lead	2066.88	2000.0	103	90.0 - 110.0	P	04/27/2009	15:44	W917173
CCV									
	Copper	1935.15	2000.0	97	90.0 - 110.0	P	04/27/2009	16:26	W917173
	Lead	2040.75	2000.0	102	90.0 - 110.0	P	04/27/2009	16:26	W917173

- 2b -

CRDL STANDARD FOR AA & ICP

Client: GOLDER ASSOCIATES **SDG No.:** W9D0298

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

AA CRDL Standard Source:

ICP CRDL Standard Source: 09C0299 / 09D0182 KG 04/29/09

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Advisory Limits (%R)	M	Analysis Date	Analysis Time	Run Number
RLCS									
	Arsenic	1.27	1.0	127	50 - 150	MS	04/28/200	11:06	118E
CRI									
	Copper	9.81	10.0	98	50 - 150	P	04/27/200	15:27	W917173
	Lead	9.08	7.5	121	50 - 150	P	04/27/200	15:27	W917173

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0298

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB	Arsenic	0.500	+/-1.200	U	0.500	1.200	MS	04/28/2009	11:04	118E
CCB	Arsenic	0.500	+/-1.200	U	0.500	1.200	MS	04/28/2009	11:14	118E
CCB	Arsenic	0.500	+/-1.200	U	0.500	1.200	MS	04/28/2009	11:29	118E
ICB	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/27/2009	15:21	W917173
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/27/2009	15:21	W917173
CCB	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/27/2009	15:50	W917173
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/27/2009	15:50	W917173
CCB	Copper	3.900	+/-10.000	U	3.900	10.000	P	04/27/2009	16:32	W917173
	Lead	3.900	+/-7.500	U	3.900	7.500	P	04/27/2009	16:32	W917173

- 3b -

PREPARATION BLANK SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0298

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Sample ID	Analyte	Result (ug/L)	Conc Qual	Q	Acceptance Limit	MDL	PQL	M	Analysis Date	Analysis Time	Run
W916206-BLK1			**WATER**								
	Arsenic	1.250U			+/-1.250	1.250	3.000	MS	04/28/2009	11:16	118E
W917173-BLK1			**WATER**								
	Copper	3.900U			+/-3.900	3.900	10.000	P	04/27/2009	15:57	W917173
	Lead	3.900U			+/-3.900	3.900	7.500	P	04/27/2009	15:57	W917173

INTERFERENCE CHECK SAMPLE

Client: GOLDER ASSOCIATES **SDG No.:** W9D0298

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

ICS Source: 08K0009/08K0010 **Instrument ID:** PE ICPMS DRC-E

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window	Analysis Date	Analysis Time	Run Number
ICSA								
	Arsenic	1.0				04/28/2009	11:08	118E
ICSAB								
	Arsenic	10.9	10.000	109	80 - 120%	04/28/2009	11:10	118E
ICSA								
	Copper	11800	10000	118	80 - 120%	04/27/2009	15:32	W917173
	Lead	18.4				04/27/2009	15:32	W917173
ICSAB								
	Copper	573	500	115	80 - 120%	04/27/2009	15:38	W917173
	Lead	478	500	96	80 - 120%	04/27/2009	15:38	W917173

- 5a -

MATRIX SPIKE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W9D0298

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Sample ID:** W9D0298-01 **Client ID:** SIEVE DRBS

Percent Solids for Sample: 0.00 **Spiked ID:** W916206-MS1 **Percent Solids for Spike Sample:** 0.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	ug/L	70 - 130	22.2243		1.2500	U	25.00	89		MS
Copper	ug/L	75 - 125	998.7027		3.9000	U	1000.00	100		P
Lead	ug/L	75 - 125	1019.8240		3.9000	U	1000.00	102		P

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W9D0298

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Sample ID:** W9D0298-01 **Client ID:** SIEVE DRBSD

Percent Solids for Sample: 0.00 **Spiked ID:** W916206-MSD1 **Percent Solids for Spike Sample:** 0.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Arsenic	ug/L	70 - 130	22.4843		1.2500	U	25.00	90		MS
Copper	ug/L	75 - 125	1000.3350		3.9000	U	1000.00	100		P
Lead	ug/L	75 - 125	1025.7980		3.9000	U	1000.00	103		P

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **Level:** LOW **SDG No.:** W9D0298

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Sample ID:** W916206-MS1 **Client ID:** SIEVE DRBSD

Percent Solids for Sample: 0.00 **Duplicate ID:** W916206-MSD1 **Percent Solids for Duplicate:** 0.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Arsenic	ug/L		22.2242		22.4843		1		MS
Copper	ug/L		998.7027		1000.3350		0		P
Lead	ug/L		1019.8239		1025.7980		1		P

- 7 -

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0298

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Aqueous LCS Source: 09D0031 **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
W916206-BS1								
	Arsenic	ug/L	25.0	23.35		93	85.0 - 115.0	MS

- 7 -

LABORATORY CONTROL SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0298

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Aqueous LCS Source: QC19115SCSN **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
W917173-BS1								
	Copper	ug/L	1000.0	975.52		98	80.0 - 120.0	P
	Lead	ug/L	1000.0	1033.76		103	80.0 - 120.0	P

- 9 -

SERIAL DILUTION SAMPLE SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0298

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Matrix: WATER **Level:** LOW **Client ID:** SIEVE DRBL

Sample ID: W9D0298-01 **Serial Dilution ID:** W916206-L1

Analyte	Initial Result ug/L	C	Serial Result ug/L	C	% Difference	Qual	Acceptance Limits	M
Arsenic	0.20	U	0.20	U			10.00 %	MS

- 10 -

METHOD DETECTION LIMITS

Client: GOLDER ASSOCIATES **SDG No.:** W9D0298

Contract: _____ **Lab Code:** SVL **Case No.:** _____ **SAS No.:** _____

Analyte	Wave- length (nm)	MDL ug/L	PQL ug/L
OPTIMA6			**Date:** 08/08/2008
Copper	324.752	3.9	10
Lead	220.353	3.9	7.5
PE ICPMS DRC-E			**Date:** 03/24/2009
Arsenic	75	0.50	1.2

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0298

Contract: _____ Lab Code: SVL Case No.: _____ SAS No.: _____

Instrument ID: OPTIMA6 Date: 04/05/2009

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Al	Ca	Fe	Mg	Ag
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	-0.0592016	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	-0.1631550	-0.0279940	-0.0837075	-0.0150323	-1.3025399
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.1843870	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0639846	0.0000000
Lead	220.35	-0.1167810	-0.0050362	0.0630847	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0339442	0.0299079	0.0000000
Nickel	232.00	0.0000000	0.0000000	-0.3396800	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0738275	-0.0417380	0.0421728	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	-0.1843900	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	-0.0261164	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0598863	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

04/29/2009

18

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0298

Contract: _____ Lab Code: SVL Case No.: _____ SAS No.: _____

Instrument ID: OPTIMA6 Date: 04/05/2009

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: As	B	Ba	Be	Cd
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.6779850	0.0000000	-0.3182230	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	14.4108000	0.0000000	0.4436040	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.7362210

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0298

Contract: _____ Lab Code: SVL Case No.: _____ SAS No.: _____

Instrument ID: OPTIMA6 Date: 04/05/2009

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Co	Cr	Cu	K	Mn
Aluminum	308.22	-2.4962299	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	6.5071702	0.0000000	0.0000000	0.0000000
Arsenic	188.98	-2.7072401	3.9285500	0.0000000	-0.0074424	-0.3211970
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	-0.1739990	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0697436	0.0000000	-0.4151710
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.2037690
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	0.8244180	0.0000000	0.2051110
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.5989680	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	25.9489002	-0.3016830	0.0000000	-0.5962220
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.7337330
Silver	328.07	0.0000000	0.0000000	0.0762193	0.0000000	0.1598950
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	2.5606401	0.3198140	0.0000000	0.0000000	-4.2953200
Vanadium	292.40	0.0000000	-2.0734200	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.6413530	0.0000000	0.0442671	0.0000000

20

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0298

Contract: _____ Lab Code: SVL Case No.: _____ SAS No.: _____

Instrument ID: OPTIMA6 Date: 04/05/2009

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Mo	Na	Ni	Pb	Sb
Aluminum	308.22	9.0120897	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	-4.0859799	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	188.98	6.0639000	-0.0140145	-0.1805600	-0.0848884	0.2678320
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	-0.0960016	0.0000000	-0.5736930	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	-0.1374680	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.3025600	0.0000000	0.2353910	0.2176160	0.0000000
Iron	273.96	-0.9255080	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	-1.0579200	0.0000000	-0.0882179	0.0000000	-0.1646600
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	2.8348300	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	-7.0323701	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	1.2860200	0.0000000	0.0000000	0.0000000	0.0000000

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: GOLDER ASSOCIATES SDG No.: W9D0298

Contract: _____ Lab Code: SVL Case No.: _____ SAS No.: _____

Instrument ID: OPTIMA6 Date: 04/05/2009

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave-Length (nm)	ICP Interelement Correction Factors For: Se	Si	Ti	Tl	V
Aluminum	308.22	0.0000000	0.0000000	1.8746800	0.0000000	18.3910999
Antimony	206.84	0.0000000	0.0000000	0.0000000	1.1360199	-3.8371999
Arsenic	188.98	-0.2555890	0.0772135	-10.9938002	0.0000000	0.5130850
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.11	0.0000000	0.0000000	0.1573650	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0788551	0.0000000	0.0000000
Calcium	315.89	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.1791190
Cobalt	228.62	0.0000000	0.0000000	1.9993100	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	-0.8674120	0.0000000	-0.1993930
Iron	273.96	0.0000000	0.0000000	-1.6692100	0.0000000	3.6069500
Lead	220.35	0.0000000	-0.1207930	-0.1395920	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	260.57	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	232.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.2541450	0.0000000	1.8904400
Vanadium	292.40	0.0000000	0.0000000	0.5687560	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W9D0298

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: OPTIMA6 **Date:** 07/26/2008

Analyte	Integration Time (sec)	LDR ug/L
Copper	20.00	70000
Lead	20.00	100000

- 12 -
LINEAR RANGES

Client: GOLDER ASSOCIATES **SDG No.:** W9D0298

Contract: **Lab Code:** SVL **Case No.:** **SAS No.:**

Instrument ID: PE ICPMS DRC-E **Date:** 03/28/2009

Analyte	Integration Time (sec)	LDR ug/L
Arsenic	1.00	4000

- 13 -

SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES

SDG No.: W9D0298

Contract:

Lab Code: SVL

Method: P

Case No.:

SAS No.:

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(mL)	Final Sample Volume (mL)	Percent Solids
Batch Number:	EPA 3005-04232009						
W917173-BLK1	PBW	MB	WATER	4/23/09	50.0	50.0	
W917173-BS1	LCSW	LCS	WATER	4/23/09	50.0	50.0	
W9D0298-01	SIEVE DRB	SAM	WATER	4/23/09	50.0	50.0	
W917173-MS1	SIEVE DRBS	MS	WATER	4/23/09	50.0	50.0	
W917173-MSD1	SIEVE DRBSD	MSD	WATER	4/23/09	50.0	50.0	

- 13 -

SAMPLE PREPARATION SUMMARY

Client: GOLDER ASSOCIATES **SDG No.:** W9D0298

Contract: **Lab Code:** SVL **Method:** MS

Case No.: **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(mL)	Final Sample Volume (mL)	Percent Solids
Batch Number:	EPA 3020A-04162009						
W916206-BLK1	PBW	MB	WATER	4/16/09	50.0	50.0	
W916206-BS1	LCSW	LCS	WATER	4/16/09	50.0	50.0	
W9D0298-01	SIEVE DRB	SAM	WATER	4/16/09	50.0	50.0	
W916206-MS1	SIEVE DRBS	MS	WATER	4/16/09	50.0	50.0	
W916206-MSD1	SIEVE DRBSD	MSD	WATER	4/16/09	50.0	50.0	

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W9D0298

Instrument ID Number: PE ICPMS DRC-E Method: MS Run Number: 118E

Start Date: 04/28/2009 End Date: 04/28/2009

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
Cal Blank	1.00	1049				X																								
Cal Std 1	1.00	1051				X																								
Cal Std 2	1.00	1053				X																								
Cal Std 3	1.00	1055				X																								
Cal Std 4	1.00	1057				X																								
Cal Std 5	1.00	1059				X																								
Cal Std 6	1.00	1101				X																								
ICV	1.00	1102				X																								
ICB	1.00	1104				X																								
RLCS	1.00	1106				X																								
ICSA	1.00	1108				X																								
ICSAB	1.00	1110				X																								
CCV	1.00	1112				X																								
CCB	1.00	1114				X																								
PBW	2.50	1116				X																								
LCSW	2.50	1118				X																								
SIEVE DRB	2.50	1120				X																								
SIEVE DRBL	12.50	1121				X																								
SIEVE DRBS	2.50	1123				X																								
SIEVE DRBSD	2.50	1125				X																								
CCV	1.00	1127				X																								
CCB	1.00	1129				X																								

14

ANALYSIS RUN LOG

Client: GOLDER ASSOCIATES Contract:

Lab Code: SVL Case No.: SAS No.: SDG No.: W9D0298

Instrument ID Number: OPTIMA6 Method: P Run Number: W917173

Start Date: 04/27/2009 End Date: 04/27/2009

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CALIB BLANK 1	1.00	1447											X		X												
STD1	1.00	1453											X		X												
STD2	1.00	1458																									
STD3	1.00	1503																									
STD4	1.00	1507																									
STD5	1.00	1511																									
ICV	1.00	1515											X		X												
ICB	1.00	1521											X		X												
CRI	1.00	1527											X		X												
ICSA	1.00	1532											X		X												
ICSAB	1.00	1538											X		X												
CCV	1.00	1544											X		X												
CCB	1.00	1550											X		X												
PBW	1.00	1557											X		X												
LCSW	1.00	1602											X		X												
SIEVE DRB	1.00	1609											X		X												
SIEVE DRBS	1.00	1614											X		X												
SIEVE DRBSD	1.00	1620											X		X												
CCV	1.00	1626											X		X												
CCB	1.00	1632											X		X												

W917173

SVL ANALYTICAL

Log/Preparation Bench Sheet

See Extraction Comments

W917173

ICP 4080 28

Matrix: Water
Prepared using: SOP 4080 (EPA 3005)

Earliest Due: 04/29/09 | Earliest Expiration: 09/30/09 17:00

			Origin	Hold Time Expires	Home Location	Client	Due Date
W917173-BLK1	Blank	[50mL - 50mL]					
W917173-BS1	LCS	[50mL - 50mL]	Spike 1: 09B0088				
W917173-MS1	Matrix Spike [W9D0298-01]	[50mL - 50mL]	Spike 1: 09B0088				
W917173-MSD1	MS Dup [W9D0298-01]	[50mL - 50mL]	Spike 1: 09B0088				
W9D0298-01	A by TR 6010B Cu Pb						29-Apr-09
ClientSample ID:	SIEVE DRB	[50mL - 50mL]	Arizona	30-Sep-09 17:00	WarmRoom 33 E	Golder Associates (AZ)	

04/29/2009

Preparation Reagents

Standard	Description	Lot Number
08J0438	HCl, conc.	K2007

Standard	Description	Lot Number
09A0206	HNO3, conc.	K1408

Spike Standards

Standard	Description	Amount (µL)
09B0088	QC19115ScSn WATER DIG	500

Standard	Description	Amount (µL)

Digested By: NP Date/Time: 4/23/09 1600/2200 Instrument ID: ICP Optima ☐1 ☐5 ☒6 ☐7

Analyzed By: AS Date/Time: 4/27/09

Reviewed By: [signature] Date: 04/28/2009 Data File(s): 0917173

Instrument operating conditions and parameters for this analytical batch are as stated in

SVL ANALYTICAL, INC. KELLOGG, IDAHO

ICP-AES STANDARDS

STANDARD	SOURCE/LOT #	PREP DATE	PREP BY
S0/ICB/CCB	09D0232	4/20/2009	AS
S1	09D0231	4/20/2009	AS
S2	09D0179	4/16/2009	AS
S3	09D0180	4/16/2009	AS
S4	09C0243	3/23/2009	AS
S5	09C0224	3/21/2009	AS
ICV/CCV	09D0236	4/21/2009	AS
CRI	09D0182	4/16/2009	AS
ICSA	09D0295	4/22/2009	AS
ICSAB	09D0296	4/22/2009	AS

Analytical Standard Summary

09D0232

30

Description: S0
Standard Type: Calibration Standard
Solvent: 2% HNO3 5% HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : -
Prepared: 20-Apr-09
Expires: 15-Oct-09

Comments: OPT 6 & 7

Analyte	CAS Number	Concentration	Units
Hydrochloric Acid	7647-01-0	50000	mg/L
Nitric Acid	7697-37-2	20000	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09D0201	HCl, conc.	Hydrochloric Ac	18-Apr-09	Vendor	15-Oct-09	1000000 ppm	50
09A0193	HNO3, conc.	Nitric Acid	15-Jan-09	Vendor	14-Jan-10	1000000 ppm	20

Anne Spradlin 4/20/09
Prepared By Date

DT 4/22/09
Reviewed By Date

Analytical Standard Summary

09D0231

31

Description: S1
Standard Type: Calibration Standard
Solvent: 2% HNO3 5% HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : -
Prepared: 20-Apr-09
Expires: 26-Jul-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	3	mg/L
Antimony	7440-36-0	3	mg/L
Arsenic	7440-38-2	3	mg/L
Barium	7440-39-3	3	mg/L
Beryllium	7440-41-7	3	mg/L
Bismuth	7440-69-9	5	mg/L
Boron	7440-42-8	3	mg/L
Cadmium	7440-43-9	3	mg/L
Calcium	7440-70-2	3	mg/L
Chromium	7440-47-3	3	mg/L
Cobalt	7440-48-4	3	mg/L
Copper	7440-50-8	3	mg/L
Gallium	7440-55-3	5	mg/L
Iron	7439-89-6	3	mg/L
Lead	7439-92-1	3	mg/L
Lithium	7439-93-2	8	mg/L
Magnesium	7439-95-4	3	mg/L
Manganese	7439-96-5	3	mg/L
Molybdenum	7439-98-7	3	mg/L
Nickel	7440-02-0	3	mg/L
Phosphorus	7723-14-0	10	mg/L
Potassium	7440-09-7	30	mg/L
Selenium	7782-49-2	3	mg/L
Silica (SiO2)	7631-86-9	3.21	mg/L
Silicon	7440-21-3	1.5	mg/L
Silver	7440-22-4	3	mg/L
Sodium	7440-23-5	3	mg/L
Strontium	7440-24-6	5	mg/L
Thallium	7440-28-0	3	mg/L
Tin	7440-31-5	5	mg/L
Titanium	7440-32-6	3	mg/L
Vanadium	7440-62-2	3	mg/L
Zinc	7440-66-6	3	mg/L

Parent Standards used in this standard:

ndard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0292	S1 MIX	Strontium	26-Jan-09	Anne Spradlin	26-Jul-09	500 mg/L	10
09A0292	S1 MIX	Phosphorus	26-Jan-09	Anne Spradlin	26-Jul-09	1000 mg/L	10
09A0292	S1 MIX	Lithium	26-Jan-09	Anne Spradlin	26-Jul-09	800 mg/L	10
09A0292	S1 MIX	Gallium	26-Jan-09	Anne Spradlin	26-Jul-09	500 mg/L	10
09A0292	S1 MIX	Bismuth	26-Jan-09	Anne Spradlin	26-Jul-09	500 mg/L	10
09A0292	S1 MIX	Tin	26-Jan-09	Anne Spradlin	26-Jul-09	500 mg/L	10
08J0535	QCS-26 (0816542)	Barium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Iron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Copper	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Cobalt	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Chromium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Calcium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Cadmium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Lead	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Beryllium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Potassium	30-Oct-08	Vendor	16-Oct-09	1000 ug/mL	30
08J0535	QCS-26 (0816542)	Arsenic	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Antimony	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Boron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Magnesium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Manganese	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Aluminum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Nickel	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Selenium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Silica (SiO2)	30-Oct-08	Vendor	16-Oct-09	107 ug/mL	30
0535	QCS-26 (0816542)	Silicon	30-Oct-08	Vendor	16-Oct-09	50 ug/mL	30
0535	QCS-26 (0816542)	Silver	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Sodium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Thallium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Titanium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Vanadium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Zinc	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30
08J0535	QCS-26 (0816542)	Molybdenum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	30

Anne Spradlin 4/20/09
Prepared By Date

DT 4/22/09
Reviewed By Date

Analytical Standard Summary

09D0179

33

Description: S2
Standard Type: Calibration Standard
Solvent: 2%HN03 5% HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 192-262-1
Prepared: 16-Apr-09
Expires: 13-Oct-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	50	mg/L
Calcium	7440-70-2	50	mg/L
Iron	7439-89-6	50	mg/L
Magnesium	7439-95-4	50	mg/L
Sodium	7440-23-5	50	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08H0316	Sodium	Sodium	26-Aug-08	Vendor	19-Feb-10	10000 ug/mL	5
08H0314	Iron	Iron	26-Aug-08	Vendor	19-Feb-10	10000 ug/mL	5
08H0313	Calcium	Calcium	26-Aug-08	Vendor	19-Feb-10	10000 ug/mL	5
08H0312	Aluminum	Aluminum	26-Aug-08	Vendor	19-Feb-10	10000 ug/mL	5
08F0350	Magnesium	Magnesium	23-Jun-08	Vendor	12-Dec-09	10000 ug/mL	5

Anne Spradlin 4/16/09
Prepared By Date

DT 4/22/09
Reviewed By Date

Analytical Standard Summary

09D0180

34

Description: S3
Standard Type: Calibration Standard
Solvent: 2%HNO3 5%HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 192-262-2
Prepared: 16-Apr-09
Expires: 07-Jun-09

Comments:

Analyte	CAS Number	Concentration	Units
Beryllium	7440-41-7	0.1	mg/L
Lanthanum	7439-91-0	10	mg/L
Scandium	7440-20-2	2	mg/L
Silica (SiO2)	7631-86-9	53.5	mg/L
Silicon	7440-21-3	25	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0111	Lanthanum	Lanthanum	12-Jan-09	Vendor	30-Jun-10	10000 ug/mL	1
07L0017	Silicon	Silicon	14-Dec-07	Vendor	07-Jun-09	10000 ug/mL	2.5
07L0017	Silicon	Silica (SiO2)	14-Dec-07	Vendor	07-Jun-09	21400 ug/mL	2.5
07L0011	Beryllium	Beryllium	14-Dec-07	Vendor	07-Jun-09	1000 ug/mL	0.1
08D0085	Scandium	Scandium	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.2

Anne Spradlin 4/16/09
Prepared By Date

DT 4/22/09
Reviewed By Date

Analytical Standard Summary

09C0243

35

Description: S4
Standard Type: Calibration Standard
Solvent: 2%HNO3 5%HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 192-264-4
Prepared: 23-Mar-09
Expires: 19-Sep-09

Comments:

Analyte	CAS Number	Concentration	Units
Cerium	7440-45-1	1	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08F0352	Cerium	Cerium	23-Jun-08	Vendor	12-Dec-09	1000 ug/mL	1

Anne Spradlin 3/23/09
Prepared By Date

DG 03/26/2009
Reviewed By Date

Analytical Standard Summary

09C0224

36

Description: S5
Standard Type: Calibration Standard
Solvent: 2%HNO3 5%HCl
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 192-259-13
Prepared: 21-Mar-09
Expires: 15-Jul-09

Comments:

Analyte	CAS Number	Concentration	Units
Uranium	7440-61-1	2	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08A0058	Uranium	Uranium	28-Jan-08	Vendor	15-Jul-09	1000 ug/mL	2

Anne Spradlin 3/21/09
Prepared By Date

DG 03/26/2009
Reviewed By Date

Analytical Standard Summary

09D0236

37

Description: ICV/CCV
Standard Type: Calibration Standard
Solvent: 2%HNO3/5%HCL
Final Volume 1000
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 08E0063
Prepared: 21-Apr-09
Expires: 15-Jul-09

Comments: OPT 6 & 7

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	2	ug/mL
Antimony	7440-36-0	2	ug/mL
Arsenic	7440-38-2	2	ug/mL
Barium	7440-39-3	2	ug/mL
Beryllium	7440-41-7	2	ug/mL
Bismuth	7440-69-9	4	ug/mL
Boron	7440-42-8	2	ug/mL
Cadmium	7440-43-9	2	ug/mL
Calcium	7440-70-2	2	ug/mL
Chromium	7440-47-3	2	ug/mL
Cobalt	7440-48-4	2	ug/mL
Copper	7440-50-8	2	ug/mL
Gallium	7440-55-3	4	ug/mL
Iron	7439-89-6	2	ug/mL
Lanthanum	7439-91-0	4	ug/mL
Lead	7439-92-1	2	ug/mL
Lithium	7439-93-2	4	ug/mL
Magnesium	7439-95-4	2	ug/mL
ganese	7439-96-5	2	ug/mL
ybdenum	7439-98-7	2	ug/mL
Nickel	7440-02-0	2	ug/mL
Phosphorus	7723-14-0	10	ug/mL
Potassium	7440-09-7	20	ug/mL
Scandium	7440-20-2	1	ug/mL
Selenium	7782-49-2	2	ug/mL
Silica (SiO2)	7631-86-9	21.4	ug/mL
Silicon	7440-21-3	10	ug/mL
Silver	7440-22-4	2	ug/mL
Sodium	7440-23-5	20	ug/mL
Strontium	7440-24-6	2	ug/mL
Thallium	7440-28-0	2	ug/mL
Tin	7440-31-5	4	ug/mL
Titanium	7440-32-6	2	ug/mL
Uranium	7440-61-1	1	ug/mL
Vanadium	7440-62-2	2	ug/mL
Zinc	7440-66-6	2	ug/mL

Analytical Standard Summary

09D0236

38

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0111	Lanthanum	Lanthanum	12-Jan-09	Vendor	30-Jun-10	10000 ug/mL	0.4
08C0081	Uranium	Uranium	10-Mar-08	Vendor	29-Aug-09	1000 ug/mL	1
08J0545	Strontium	Strontium	30-Oct-08	Vendor	21-Apr-10	10000 ug/mL	0.2
08J0536	QCS-26 (0816541)	Beryllium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Iron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Cobalt	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Chromium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Calcium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Magnesium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Boron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Lead	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Barium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Arsenic	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Antimony	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Aluminum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Cadmium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Thallium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Zinc	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Copper	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Titanium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Manganese	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Silver	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Silicon	30-Oct-08	Vendor	16-Oct-09	50 ug/mL	20
08J0536	QCS-26 (0816541)	Silica (SiO2)	30-Oct-08	Vendor	16-Oct-09	107 ug/mL	20
08J0536	QCS-26 (0816541)	Selenium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Potassium	30-Oct-08	Vendor	16-Oct-09	1000 ug/mL	20
08J0536	QCS-26 (0816541)	Nickel	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Molybdenum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Vanadium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0544	Phosphorous	Phosphorus	30-Oct-08	Vendor	16-Apr-10	10000 ug/mL	1
08J0546	Tin	Tin	30-Oct-08	Vendor	16-Apr-10	10000 ug/mL	0.4
08A0060	Sodium	Sodium	28-Jan-08	Vendor	15-Jul-09	10000 ug/mL	1.8
08D0086	Lithium	Lithium	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.4
08D0085	Scandium	Scandium	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.1
08D0084	Bismuth	Bismuth	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.4
08D0083	Gallium	Gallium	14-Apr-08	Vendor	03-Oct-09	10000 ug/mL	0.4

Anne Spradlin 4/21/09

Prepared By Date

DT 4/22/09

Reviewed By Date

Analytical Standard Summary

09D0182

39

Description: CRI SOLUTION
Standard Type: Calibration Standard
Solvent: 2%HNO3/5%HCL
Final Volume 500
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 08D0147
Prepared: 16-Apr-09
Expires: 07-Jun-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	0.08	ug/mL
Antimony	7440-36-0	0.02	ug/mL
Arsenic	7440-38-2	0.025	ug/mL
Barium	7440-39-3	0.004	ug/mL
Beryllium	7440-41-7	0.002	ug/mL
Bismuth	7440-69-9	0.06	ug/mL
Boron	7440-42-8	0.04	ug/mL
Cadmium	7440-43-9	0.002	ug/mL
Calcium	7440-70-2	0.04	ug/mL
Chromium	7440-47-3	0.006	ug/mL
Cobalt	7440-48-4	0.006	ug/mL
Copper	7440-50-8	0.01	ug/mL
Gallium	7440-55-3	0.02	ug/mL
Hydrochloric Acid	7647-01-0	7.5	ug/mL
Iron	7439-89-6	0.06	ug/mL
Lanthanum	7439-91-0	0.005	ug/mL
Lead	7439-92-1	0.0075	ug/mL
Lithium	7439-93-2	0.02	ug/mL
[illegible]nesium	7439-95-4	0.06	ug/mL
[illegible]nganese	7439-96-5	0.004	ug/mL
Molybdenum	7439-98-7	0.008	ug/mL
Nickel	7440-02-0	0.01	ug/mL
Phosphorus	7723-14-0	0.05	ug/mL
Potassium	7440-09-7	0.5	ug/mL
Scandium	7440-20-2	0.002	ug/mL
Selenium	7782-49-2	0.04	ug/mL
Silica (SiO2)	7631-86-9	0.171	ug/mL
Silicon	7440-21-3	0.08	ug/mL
Silver	7440-22-4	0.005	ug/mL
Sodium	7440-23-5	0.5	ug/mL
Strontium	7440-24-6	0.005	ug/mL
Thallium	7440-28-0	0.015	ug/mL
Tin	7440-31-5	0.05	ug/mL
Titanium	7440-32-6	0.005	ug/mL
Uranium	7440-61-1	0.02	ug/mL
Vanadium	7440-62-2	0.005	ug/mL
Zinc	7440-66-6	0.01	ug/mL

Analytical Standard Summary

09D0182

40

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0293	CRI STOCK	Calcium	26-Jan-09	Anne Spradlin	07-Jun-09	4 ug/mL	5
09A0293	CRI STOCK	Lead	26-Jan-09	Anne Spradlin	07-Jun-09	0.75 ug/mL	5
09A0293	CRI STOCK	Lanthanum	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5
09A0293	CRI STOCK	Iron	26-Jan-09	Anne Spradlin	07-Jun-09	6 ug/mL	5
09A0293	CRI STOCK	Hydrochloric Ac	26-Jan-09	Anne Spradlin	07-Jun-09	750 ug/mL	5
09A0293	CRI STOCK	Gallium	26-Jan-09	Anne Spradlin	07-Jun-09	2 ug/mL	5
09A0293	CRI STOCK	Copper	26-Jan-09	Anne Spradlin	07-Jun-09	1 ug/mL	5
09A0293	CRI STOCK	Aluminum	26-Jan-09	Anne Spradlin	07-Jun-09	8 ug/mL	5
09A0293	CRI STOCK	Chromium	26-Jan-09	Anne Spradlin	07-Jun-09	0.6 ug/mL	5
09A0293	CRI STOCK	Manganese	26-Jan-09	Anne Spradlin	07-Jun-09	0.4 ug/mL	5
09A0293	CRI STOCK	Cadmium	26-Jan-09	Anne Spradlin	07-Jun-09	0.2 ug/mL	5
09A0293	CRI STOCK	Boron	26-Jan-09	Anne Spradlin	07-Jun-09	4 ug/mL	5
09A0293	CRI STOCK	Bismuth	26-Jan-09	Anne Spradlin	07-Jun-09	6 ug/mL	5
09A0293	CRI STOCK	Beryllium	26-Jan-09	Anne Spradlin	07-Jun-09	0.2 ug/mL	5
09A0293	CRI STOCK	Barium	26-Jan-09	Anne Spradlin	07-Jun-09	0.4 ug/mL	5
09A0293	CRI STOCK	Arsenic	26-Jan-09	Anne Spradlin	07-Jun-09	2.5 ug/mL	5
09A0293	CRI STOCK	Antimony	26-Jan-09	Anne Spradlin	07-Jun-09	2 ug/mL	5
09A0293	CRI STOCK	Cobalt	26-Jan-09	Anne Spradlin	07-Jun-09	0.6 ug/mL	5
09A0293	CRI STOCK	Silica (SiO2)	26-Jan-09	Anne Spradlin	07-Jun-09	17.1 ug/mL	5
09A0293	CRI STOCK	Vanadium	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5
09A0293	CRI STOCK	Uranium	26-Jan-09	Anne Spradlin	07-Jun-09	2 ug/mL	5
09A0293	CRI STOCK	Titanium	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5
09A0293	CRI STOCK	Tin	26-Jan-09	Anne Spradlin	07-Jun-09	5 ug/mL	5
09A0293	CRI STOCK	Thallium	26-Jan-09	Anne Spradlin	07-Jun-09	1.5 ug/mL	5
09A0293	CRI STOCK	Strontium	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5
09A0293	CRI STOCK	Sodium	26-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	5
09A0293	CRI STOCK	Lithium	26-Jan-09	Anne Spradlin	07-Jun-09	2 ug/mL	5
09A0293	CRI STOCK	Silicon	26-Jan-09	Anne Spradlin	07-Jun-09	8 ug/mL	5
09A0293	CRI STOCK	Magnesium	26-Jan-09	Anne Spradlin	07-Jun-09	6 ug/mL	5
09A0293	CRI STOCK	Selenium	26-Jan-09	Anne Spradlin	07-Jun-09	4 ug/mL	5
09A0293	CRI STOCK	Scandium	26-Jan-09	Anne Spradlin	07-Jun-09	0.2 ug/mL	5
09A0293	CRI STOCK	Potassium	26-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	5
09A0293	CRI STOCK	Phosphorus	26-Jan-09	Anne Spradlin	07-Jun-09	5 ug/mL	5
09A0293	CRI STOCK	Nickel	26-Jan-09	Anne Spradlin	07-Jun-09	1 ug/mL	5
09A0293	CRI STOCK	Molybdenum	26-Jan-09	Anne Spradlin	07-Jun-09	0.8 ug/mL	5
09A0293	CRI STOCK	Zinc	26-Jan-09	Anne Spradlin	07-Jun-09	1 ug/mL	5
09A0293	CRI STOCK	Silver	26-Jan-09	Anne Spradlin	07-Jun-09	0.5 ug/mL	5

Anne Spradlin 4/16/09

Prepared By Date

DT 4/22/09

Reviewed By Date

Analytical Standard Summary

09D0295

41

Description: ICSA
Standard Type: Calibration Standard
Solvent: 2%HNO3 5%HCl
Final Volume 200
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 88E
Prepared: 22-Apr-09
Expires: 07-Jun-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	500	mg/L
Calcium	7440-70-2	500	mg/L
Chromium	7440-47-3	10	mg/L
Copper	7440-50-8	10	mg/L
Iron	7439-89-6	200	mg/L
Magnesium	7439-95-4	500	mg/L
Manganese	7439-96-5	10	mg/L
Nickel	7440-02-0	10	mg/L
Titanium	7440-32-6	10	mg/L
Vanadium	7440-62-2	10	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
09A0118	Manganese	Manganese	12-Jan-09	Vendor	30-Jun-10	1000 ug/mL	2
09A0117	Nickel	Nickel	12-Jan-09	Vendor	30-Jun-10	1000 ug/mL	2
09A0116	Titanium	Titanium	12-Jan-09	Vendor	30-Jun-10	1000 ug/mL	2
08J0538	CLP-INF-1 (0805302)	Magnesium	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Iron	30-Oct-08	Vendor	16-Oct-09	2000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Calcium	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Aluminum	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08E0345	Vanadium	Vanadium	22-Jun-08	Vendor	12-Dec-09	1000 ug/mL	2
07L0014	Copper	Copper	14-Dec-07	Vendor	07-Jun-09	1000 ug/mL	2
07L0013	Chromium	Chromium	14-Dec-07	Vendor	07-Jun-09	1000 ug/mL	2

Anne Spradlin 4/22/09
Prepared By Date

DG 04/22/09
Reviewed By Date

Analytical Standard Summary

09D0296

Description: ICSAB SOLUTION
Standard Type: Calibration Standard
Solvent: 2%HNO3/5%HCL
Final Volume 200
Vials: 1

Department: Metals
Prepared By: Anne Spradlin
Lot : 08E0060
Prepared: 22-Apr-09
Expires: 07-Jun-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	500	mg/L
Antimony	7440-36-0	0.5	mg/L
Arsenic	7440-38-2	0.5	mg/L
Barium	7440-39-3	0.5	mg/L
Beryllium	7440-41-7	0.5	mg/L
Cadmium	7440-43-9	0.5	mg/L
Calcium	7440-70-2	500	mg/L
Chromium	7440-47-3	0.5	mg/L
Cobalt	7440-48-4	0.5	mg/L
Copper	7440-50-8	0.5	mg/L
Iron	7439-89-6	200	mg/L
Lead	7439-92-1	0.5	mg/L
Magnesium	7439-95-4	500	mg/L
Manganese	7439-96-5	0.5	mg/L
Nickel	7440-02-0	0.5	mg/L
Selenium	7782-49-2	0.5	mg/L
Silver	7440-22-4	0.5	mg/L
Thallium	7440-28-0	0.5	mg/L
[illegible]nium	7440-61-1	0.5	mg/L
Vanadium	7440-62-2	0.5	mg/L
Zinc	7440-66-6	0.5	mg/L

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08J0538	CLP-INF-1 (0805302)	Calcium	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Iron	30-Oct-08	Vendor	16-Oct-09	2000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Magnesium	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
08J0538	CLP-INF-1 (0805302)	Aluminum	30-Oct-08	Vendor	16-Oct-09	5000 ug/mL	20
09A0309	ICSAB STOCK	Cobalt	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Antimony	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Arsenic	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Barium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Beryllium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Chromium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Zinc	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Copper	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Lead	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Manganese	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Nickel	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Selenium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Thallium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Uranium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
09A0309	ICSAB STOCK	Vanadium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
[illegible]0309	ICSAB STOCK	Cadmium	20-Jan-09	Anne Spradlin	07-Jun-09	50 ug/mL	2
[illegible]0184	Silver	Silver	13-Nov-08	Vendor	04-May-10	1000 ug/mL	0.1

Anne Spradlin 4/22/09
Prepared By Date

DG 04/22/09
Reviewed By Date

ICP CONTROL SHEET

Instrument: Optima 6 Date: 04/27/09 Data File: 09117B

Operator: AS Time: 247

43

Sample	Time	Elements Out of Control	Comments	Batch
ICV 5% 200.7	315	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		W917173
ICV 10% 6010B		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
ICB		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CRI		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
ICSA		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
ICSB		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV1	344	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB1		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV2	426	Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB2		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV3		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB3		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV4		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB4		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV5		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB5		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV6		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB6		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV7		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB7		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV8		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB8		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV9		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB9		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCV10		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		
CCB10		Ag Al As B Ba Be Bi Ca Cd Co Cr Cu Fe Ga K La Li Mg Mn Mo Na Ni P Pb Sb Sc Se Si SiO2 Sn Sr Ti Tl U V Zn		

44

Analysis Begun

Start Time: 4/27/2009 2:47:17 PM
Logged In Analyst: optima6
Plasma On Time: 4/27/2009 2:05:29 PM
Technique: ICP Continuous
Spectrometer Model: Optima 5300 DV, S/N 077N6062101Autosampler Model: AS-93plus

Sample Information File: C:\pe\5300dv\Sample Information\START.sif
Batch ID:
Results Data Set: 09117A
Results Library: C:\pe\5300dv\Results\Results.mdb

Method Loaded
Method Name: OPT6
IEC File: OPTIMA6.iec
Method Description:
Method Last Saved: 4/27/2009 2:15:48 PM
MSF File:

Sequence No.: 1
Sample ID: Calib Blank 1
Analyst:
Initial Sample Wt:
Dilution:
Autosampler Location: 1
Date Collected: 4/27/2009 2:47:18 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: Calib Blank 1

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	231779.1	3234.17	1.40%	100.000	%
Lu 261.542 A	1563364.9	2989.87	0.19%	100.000	%
Ag 328.068 At	-247.7	1.43	0.58%	[0.00]	mg/L
Al 308.215 Rt	-2.0	1.12	56.31%	[0.00]	mg/L
As 188.979 At	-11.2	1.36	12.19%	[0.00]	mg/L
B 249.677 Rt	-9.5	1.12	11.80%	[0.00]	mg/L
Ba 233.527 At	-182.6	1.85	1.01%	[0.00]	mg/L
Be 313.107 Rt	29.6	2.42	8.17%	[0.00]	mg/L
Bi 222.821 At	-65.1	2.20	3.39%	[0.00]	mg/L
Ca 315.887 Rt	-268.4	7.26	2.70%	[0.00]	mg/L
Cd 226.502 At	-105.4	2.20	2.09%	[0.00]	mg/L
Ce 418.660 At	-440.3	3.63	0.82%	[0.00]	mg/L
Co 228.616 At	-60.7	1.21	1.99%	[0.00]	mg/L
Cr 267.716 At	48.8	1.67	3.42%	[0.00]	mg/L
Cu 324.752 At	5598.7	38.52	0.69%	[0.00]	mg/L
Fe 273.955 Rt	-12.2	0.16	1.29%	[0.00]	mg/L
Ga 417.206 At	138.9	2.81	2.02%	[0.00]	mg/L
K 766.490 Rt	-5.0	22.52	452.85%	[0.00]	mg/L
La 379.478 At	-114.3	2.34	2.05%	[0.00]	mg/L
Li 670.784 Rt	492.5	41.81	8.49%	[0.00]	mg/L
Mg 279.077 Rt	20.3	1.23	6.07%	[0.00]	mg/L
Mn 260.568 Rt	-13.5	0.60	4.47%	[0.00]	mg/L
Mo 202.031 At	36.3	3.04	8.38%	[0.00]	mg/L
Na 589.592 Rt	122.6	16.89	13.78%	[0.00]	mg/L
Ni 232.003 At	-242.7	2.32	0.95%	[0.00]	mg/L
P 213.617 At	-50.0	1.74	3.47%	[0.00]	mg/L
Pb 220.353 At	58.0	2.53	4.35%	[0.00]	mg/L
Sb 206.836 At	2.4	0.13	5.10%	[0.00]	mg/L
Sc 361.383 At	7.6	2.97	39.03%	[0.00]	mg/L
Se 196.026 At	6.6	1.13	17.23%	[0.00]	mg/L
Si 251.611 Rt	40.6	0.06	0.15%	[0.00]	mg/L
SIO2 251.611 Rt	40.6	0.06	0.15%	[0.00]	mg/L
Sn 189.927 At	3.1	1.17	37.31%	[0.00]	mg/L
Sr 421.552 Rt	360.8	8.65	2.40%	[0.00]	mg/L
Ti 336.121 At	-896.3	5.32	0.59%	[0.00]	mg/L
Tl 190.801 At	-0.7	1.43	218.77%	[0.00]	mg/L
U 385.958 At	820.3	8.26	1.01%	[0.00]	mg/L
V 292.402 At	83.4	8.16	9.79%	[0.00]	mg/L

15

Zn 206.200 At	30.9	1.89	6.10%	[0.00] mg/L

Sequence No.: 2
Sample ID: STD1
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 2
Date Collected: 4/27/2009 2:53:00 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Sequence No.: 2
Sample ID: STD1
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 2
Date Collected: 4/27/2009 2:53:00 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD1

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	236028.6	5.06	0.00%	101.833	%
Lu 261.542 A	1565070.7	6333.10	0.40%	100.109	%
Ag 328.068 At	284237.7	454.19	0.16%	[3]	mg/L
As 188.979 At	979.9	1.26	0.13%	[3]	mg/L
B 249.677 Rt	16245.1	23.88	0.15%	[3]	mg/L
Ba 233.527 At	80837.9	466.81	0.58%	[3]	mg/L
Be 313.107 Rt	451412.2	1127.69	0.25%	[3]	mg/L
Bi 222.821 At	7040.9	14.69	0.21%	[5]	mg/L
Cd 226.502 At	79160.3	134.17	0.17%	[3]	mg/L
Co 228.616 At	18483.1	28.07	0.15%	[3]	mg/L
Cr 267.716 At	62211.2	68.47	0.11%	[3]	mg/L
Cu 324.752 At	491144.5	1240.06	0.25%	[3]	mg/L
Ga 417.206 At	364927.0	1230.24	0.34%	[5]	mg/L
K 766.490 Rt	157849.1	1688.59	1.07%	[30]	mg/L
Li 670.784 Rt	1455017.1	164.77	0.01%	[8]	mg/L
Mn 260.568 Rt	41742.4	99.88	0.24%	[3]	mg/L
Mo 202.031 At	13662.0	47.05	0.34%	[3]	mg/L
Ni 232.003 At	19485.1	31.54	0.16%	[3]	mg/L
P 213.617 At	11059.7	3.04	0.03%	[10]	mg/L
Pb 220.353 At	7624.7	18.15	0.24%	[3]	mg/L
Sb 206.836 At	1969.1	2.35	0.12%	[3]	mg/L
Se 196.026 At	843.7	5.72	0.68%	[3]	mg/L
Sn 189.927 At	4561.1	2.82	0.06%	[5]	mg/L
Sr 421.552 Rt	2681728.3	6176.03	0.23%	[5]	mg/L
Ti 336.121 At	525410.8	540.00	0.10%	[3]	mg/L
Tl 190.801 At	1648.6	9.65	0.59%	[3]	mg/L
V 292.402 At	235935.4	112.66	0.05%	[3]	mg/L
Zn 206.200 At	20289.0	131.45	0.65%	[3]	mg/L

Sequence No.: 3
Sample ID: STD2
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 3
Date Collected: 4/27/2009 2:58:39 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD2

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	233070.2	1149.54	0.49%	100.557	%
Lu 261.542 A	1563377.0	2376.34	0.15%	100.001	%
Al 308.215 R†	56096.8	18.29	0.03%	[50]	mg/L
Ca 315.887 R†	141657.6	384.06	0.27%	[50]	mg/L
Fe 273.955 R†	41382.0	105.82	0.26%	[50]	mg/L
Mg 279.077 R†	57768.2	92.01	0.16%	[50]	mg/L
Na 589.592 R†	599982.5	413.63	0.07%	[50]	mg/L

18

Sequence No.: 4
Sample ID: STD3
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 4
Date Collected: 4/27/2009 3:03:09 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD3

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	238614.6	1620.90	0.68%	102.949	%
Lu 261.542 A	1609822.8	3774.80	0.23%	102.972	%
La 379.478 A†	837265.0	81.46	0.01%	[10]	mg/L
Sc 361.383 A†	1707740.4	1321.67	0.08%	[2]	mg/L
Si 251.611 R†	38328.5	79.94	0.21%	[25]	mg/L
SIO2 251.611 R†	38328.5	79.94	0.21%	[53.5]	mg/L

Sequence No.: 5
Sample ID: STD4
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 5
Date Collected: 4/27/2009 3:07:23 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD4

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	238454.9	2305.87	0.97%	102.880	%
Lu 261.542 A	1578323.9	1113.45	0.07%	100.957	%
Ce 418.660 At	49922.7	99.89	0.20%	[1]	mg/L

50

Sequence No.: 6
Sample ID: STD5
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 6
Date Collected: 4/27/2009 3:11:22 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: STD5

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Calib Units
Lu 261.542 R	239530.6	1372.17	0.57%	103.344	%
Lu 261.542 A	1575022.1	1695.51	0.11%	100.746	%
U 385.958 At	308.2	2.22	0.72%	[2.0]	mg/L

Calibration Summary

Analyte	Stds.	Equation	Intercept	Slope	Curvature	Corr. Coef.	Reslope
Ag 328.068 A	1	Lin, Calc Int	-0.0	94750	0.00000	1.000000	
Al 308.215 R	1	Lin, Calc Int	0.0	1122	0.00000	1.000000	
As 188.979 A	1	Lin, Calc Int	-0.0	326.6	0.00000	1.000000	
B 249.677 R	1	Lin, Calc Int	0.0	5415	0.00000	1.000000	
Ba 233.527 A	1	Lin, Calc Int	0.0	26950	0.00000	1.000000	
Be 313.107 R	1	Lin, Calc Int	0.0	150500	0.00000	1.000000	
Bi 222.821 A	1	Lin, Calc Int	0.0	1408	0.00000	1.000000	
Ca 315.887 R	1	Lin, Calc Int	0.0	2833	0.00000	1.000000	
Cd 226.502 A	1	Lin, Calc Int	0.0	26390	0.00000	1.000000	
Ce 418.660 A	1	Lin, Calc Int	0.0	49920	0.00000	1.000000	
Co 228.616 A	1	Lin, Calc Int	0.0	6161	0.00000	1.000000	
Cr 267.716 A	1	Lin, Calc Int	0.0	20740	0.00000	1.000000	
Cu 324.752 A	1	Lin, Calc Int	0.0	163700	0.00000	1.000000	
Fe 273.955 R	1	Lin, Calc Int	0.0	827.6	0.00000	1.000000	
Ga 417.206 A	1	Lin, Calc Int	0.0	72990	0.00000	1.000000	
K 766.490 R	1	Lin, Calc Int	0.0	5262	0.00000	1.000000	
La 379.478 A	1	Lin, Calc Int	0.0	83730	0.00000	1.000000	
Li 670.784 R	1	Lin, Calc Int	0.0	181900	0.00000	1.000000	
Mg 279.077 R	1	Lin, Calc Int	0.0	1155	0.00000	1.000000	
Mn 260.568 R	1	Lin, Calc Int	0.0	13910	0.00000	1.000000	
Mo 202.031 A	1	Lin, Calc Int	0.0	4554	0.00000	1.000000	
Na 589.592 R	1	Lin, Calc Int	0.0	12000	0.00000	1.000000	
Ni 232.003 A	1	Lin, Calc Int	0.0	6495	0.00000	1.000000	
P 213.617 A	1	Lin, Calc Int	0.0	1106	0.00000	1.000000	
Pb 220.353 A	1	Lin, Calc Int	0.0	2542	0.00000	1.000000	
Sb 206.836 A	1	Lin, Calc Int	0.0	656.4	0.00000	1.000000	
Sc 361.383 A	1	Lin, Calc Int	0.0	853900	0.00000	1.000000	
Se 196.026 A	1	Lin, Calc Int	0.0	281.2	0.00000	1.000000	
Si 251.611 R	1	Lin, Calc Int	0.0	1533	0.00000	1.000000	
SIO2 251.611 R	1	Lin, Calc Int	0.0	716.4	0.00000	1.000000	
Sn 189.927 A	1	Lin, Calc Int	0.0	912.2	0.00000	1.000000	
Sr 421.552 R	1	Lin, Calc Int	0.0	536300	0.00000	1.000000	
Ti 336.121 A	1	Lin, Calc Int	0.0	175100	0.00000	1.000000	
Tl 190.801 A	1	Lin, Calc Int	0.0	549.5	0.00000	1.000000	
U 385.958 A	1	Lin, Calc Int	0.0	154.1	0.00000	1.000000	
V 292.402 A	1	Lin, Calc Int	0.0	78650	0.00000	1.000000	
Zn 206.200 A	1	Lin, Calc Int	0.0	6763	0.00000	1.000000	

Sequence No.: 7
Sample ID: ICV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 10
Date Collected: 4/27/2009 3:15:46 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ICV

Analyte	Mean Corrected Intensity	Calib Conc.	Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	236372.3	101.982	%	0.7390				0.72%
Lu 261.542 A	1568857.1	100.351	%	0.1168				0.12%
Ag 328.068 At	197446.5	2.08284	mg/L	0.001033	2.08284	mg/L	0.001033	0.05%
QC value within limits for Ag 328.068 A Recovery = 104.14%								
Al 308.215 Rt	2310.5	2.00334	mg/L	0.020347	2.00334	mg/L	0.020347	1.02%
QC value within limits for Al 308.215 R Recovery = 100.17%								
As 188.979 At	713.9	2.06194	mg/L	0.016393	2.06194	mg/L	0.016393	0.80%
QC value within limits for As 188.979 A Recovery = 103.10%								
B 249.677 Rt	10835.4	2.00237	mg/L	0.018843	2.00237	mg/L	0.018843	0.94%
QC value within limits for B 249.677 R Recovery = 100.12%								
Ba 233.527 At	54256.4	2.01412	mg/L	0.007804	2.01412	mg/L	0.007804	0.39%
QC value within limits for Ba 233.527 A Recovery = 100.71%								
Be 313.107 Rt	298659.3	1.98505	mg/L	0.007678	1.98505	mg/L	0.007678	0.39%
QC value within limits for Be 313.107 R Recovery = 99.25%								
Bi 222.821 At	5436.0	3.83238	mg/L	0.013228	3.83238	mg/L	0.013228	0.35%
QC value within limits for Bi 222.821 A Recovery = 95.81%								
Ca 315.887 Rt	5697.4	2.00048	mg/L	0.019306	2.00048	mg/L	0.019306	0.97%
QC value within limits for Ca 315.887 R Recovery = 100.02%								
Cd 226.502 At	53353.2	2.02260	mg/L	0.001137	2.02260	mg/L	0.001137	0.06%
QC value within limits for Cd 226.502 A Recovery = 101.13%								
Ce 418.660 At	-609.6	-0.028954	mg/L	0.0000529	-0.028954	mg/L	0.0000529	0.18%
Co 228.616 At	12387.5	2.00415	mg/L	0.000829	2.00415	mg/L	0.000829	0.04%
QC value within limits for Co 228.616 A Recovery = 100.21%								
Cr 267.716 At	41576.4	2.00634	mg/L	0.007611	2.00634	mg/L	0.007611	0.38%
QC value within limits for Cr 267.716 A Recovery = 100.32%								
Cu 324.752 At	324890.3	1.98545	mg/L	0.008556	1.98545	mg/L	0.008556	0.43%
QC value within limits for Cu 324.752 A Recovery = 99.27%								
Fe 273.955 Rt	1705.0	2.05887	mg/L	0.019511	2.05887	mg/L	0.019511	0.95%
QC value within limits for Fe 273.955 R Recovery = 102.94%								
Ga 417.206 At	288985.6	3.95213	mg/L	0.017912	3.95213	mg/L	0.017912	0.45%
QC value within limits for Ga 417.206 A Recovery = 98.80%								
K 766.490 Rt	104274.3	19.8175	mg/L	0.09939	19.8175	mg/L	0.09939	0.50%
QC value within limits for K 766.490 R Recovery = 99.09%								
La 379.478 At	337074.6	4.02575	mg/L	0.006721	4.02575	mg/L	0.006721	0.17%
QC value within limits for La 379.478 A Recovery = 100.64%								
Li 670.784 Rt	706038.2	3.88185	mg/L	0.006442	3.88185	mg/L	0.006442	0.17%
QC value within limits for Li 670.784 R Recovery = 97.05%								
Mg 279.077 Rt	2330.8	2.02762	mg/L	0.008723	2.02762	mg/L	0.008723	0.43%
QC value within limits for Mg 279.077 R Recovery = 101.38%								
Mn 260.568 Rt	27590.3	1.98205	mg/L	0.007280	1.98205	mg/L	0.007280	0.37%
QC value within limits for Mn 260.568 R Recovery = 99.10%								
Mo 202.031 At	9324.1	2.04960	mg/L	0.001140	2.04960	mg/L	0.001140	0.06%
QC value within limits for Mo 202.031 A Recovery = 102.48%								
Na 589.592 Rt	244333.9	20.3618	mg/L	0.03626	20.3618	mg/L	0.03626	0.18%
QC value within limits for Na 589.592 R Recovery = 101.81%								
Ni 232.003 At	13571.9	2.03865	mg/L	0.000525	2.03865	mg/L	0.000525	0.03%
QC value within limits for Ni 232.003 A Recovery = 101.93%								
P 213.617 At	11271.0	10.1244	mg/L	0.03421	10.1244	mg/L	0.03421	0.34%
QC value within limits for P 213.617 A Recovery = 101.24%								
Pb 220.353 At	5169.5	2.03977	mg/L	0.003448	2.03977	mg/L	0.003448	0.17%
QC value within limits for Pb 220.353 A Recovery = 101.99%								
Sb 206.836 At	1355.1	2.07180	mg/L	0.014400	2.07180	mg/L	0.014400	0.70%
QC value within limits for Sb 206.836 A Recovery = 103.59%								
Sc 361.383 At	838440.6	0.980123	mg/L	0.0007478	0.980123	mg/L	0.0007478	0.08%
QC value within limits for Sc 361.383 A Recovery = 98.01%								
Se 196.026 At	593.9	2.10973	mg/L	0.011694	2.10973	mg/L	0.011694	0.55%
QC value greater than the upper limit for Se 196.026 A Recovery = 105.49%								
Si 251.611 Rt	15745.6	10.2022	mg/L	0.08304	10.2022	mg/L	0.08304	0.81%
QC value within limits for Si 251.611 R Recovery = 102.02%								
SIO2 251.611 Rt	15745.6	21.8343	mg/L	0.17770	21.8343	mg/L	0.17770	0.81%

52

QC value within limits for SIO2 251.611 R Recovery = 102.03%							
Sn 189.927 At	3664.6	4.02296	mg/L	0.009788	4.02296 mg/L	0.009788	0.24%
QC value within limits for Sn 189.927 A Recovery = 100.57%							
Sr 421.552 Rt	1032517.0	1.92505	mg/L	0.007691	1.92505 mg/L	0.007691	0.40%
QC value within limits for Sr 421.552 R Recovery = 96.25%							
Ti 336.121 At	381776.5	1.99120	mg/L	0.000959	1.99120 mg/L	0.000959	0.05%
QC value within limits for Ti 336.121 A Recovery = 99.56%							
Tl 190.801 At	1136.5	2.06744	mg/L	0.014285	2.06744 mg/L	0.014285	0.69%
QC value within limits for Tl 190.801 A Recovery = 103.37%							
U 385.958 At	364.7	2.01090	mg/L	0.048843	2.01090 mg/L	0.048843	2.43%
V 292.402 At	157017.2	2.00067	mg/L	0.000205	2.00067 mg/L	0.000205	0.01%
QC value within limits for V 292.402 A Recovery = 100.03%							
Zn 206.200 At	13861.8	2.04320	mg/L	0.007388	2.04320 mg/L	0.007388	0.36%
QC value within limits for Zn 206.200 A Recovery = 102.16%							

QC Failed. Continue with analysis.

Sequence No.: 8 Autosampler Location: 1
Sample ID: ICB Date Collected: 4/27/2009 3:21:23 PM
Analyst: Data Type: Original
Initial Sample Wt: Initial Sample Vol:
Dilution: Sample Prep Vol:

Mean Data: ICB

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	235789.6	101.730	%	0.5592				0.55%
Lu 261.542 A	1577331.1	100.893	%	0.0164				0.02%
Ag 328.068 At	3.5	0.000037	mg/L	0.0000080	0.000037	mg/L	0.0000080	21.47%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	2.5	0.002263	mg/L	0.0011694	0.002263	mg/L	0.0011694	51.67%
QC value within limits for Al 308.215 R Recovery = Not calculated								
As 188.979 At	-0.1	-0.000409	mg/L	0.0012263	-0.000409	mg/L	0.0012263	300.08%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	9.9	0.001827	mg/L	0.0000531	0.001827	mg/L	0.0000531	2.91%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	1.8	0.000065	mg/L	0.0000677	0.000065	mg/L	0.0000677	103.79%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	2.6	0.000018	mg/L	0.0000110	0.000018	mg/L	0.0000110	62.92%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	8.9	0.006310	mg/L	0.0031134	0.006310	mg/L	0.0031134	49.34%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	-2.1	-0.000762	mg/L	0.0004778	-0.000762	mg/L	0.0004778	62.69%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	-3.1	-0.000116	mg/L	0.0000019	-0.000116	mg/L	0.0000019	1.67%
QC value within limits for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	23.7	0.000462	mg/L	0.0000821	0.000462	mg/L	0.0000821	17.76%
Co 228.616 At	-0.3	-0.000049	mg/L	0.0004864	-0.000049	mg/L	0.0004864	994.60%
QC value within limits for Co 228.616 A Recovery = Not calculated								
Cr 267.716 At	0.3	0.000016	mg/L	0.0001512	0.000016	mg/L	0.0001512	962.83%
QC value within limits for Cr 267.716 A Recovery = Not calculated								
Cu 324.752 At	-68.1	-0.000416	mg/L	0.0000641	-0.000416	mg/L	0.0000641	15.40%
QC value within limits for Cu 324.752 A Recovery = Not calculated								
Fe 273.955 Rt	-2.1	-0.002571	mg/L	0.0045252	-0.002571	mg/L	0.0045252	176.01%
QC value within limits for Fe 273.955 R Recovery = Not calculated								
Ga 417.206 At	2.7	0.000018	mg/L	0.0001183	0.000018	mg/L	0.0001183	655.50%
QC value within limits for Ga 417.206 A Recovery = Not calculated								
K 766.490 Rt	0.3	0.000060	mg/L	0.0003931	0.000060	mg/L	0.0003931	658.98%
QC value within limits for K 766.490 R Recovery = Not calculated								
La 379.478 At	10.0	0.000116	mg/L	0.0000411	0.000116	mg/L	0.0000411	35.33%
QC value within limits for La 379.478 A Recovery = Not calculated								
Li 670.784 Rt	344.6	0.001895	mg/L	0.0002729	0.001895	mg/L	0.0002729	14.40%
QC value within limits for Li 670.784 R Recovery = Not calculated								
Mg 279.077 Rt	-2.4	-0.002074	mg/L	0.0023863	-0.002074	mg/L	0.0023863	115.07%
QC value within limits for Mg 279.077 R Recovery = Not calculated								
Mn 260.568 Rt	-0.7	-0.000048	mg/L	0.0000445	-0.000048	mg/L	0.0000445	93.36%
QC value within limits for Mn 260.568 R Recovery = Not calculated								
Mo 202.031 At	-1.7	-0.000370	mg/L	0.0003475	-0.000370	mg/L	0.0003475	94.00%
QC value within limits for Mo 202.031 A Recovery = Not calculated								
Na 589.592 Rt	29.1	0.002428	mg/L	0.0010952	0.002428	mg/L	0.0010952	45.11%
QC value within limits for Na 589.592 R Recovery = Not calculated								
Ni 232.003 At	-1.4	-0.000217	mg/L	0.0006172	-0.000217	mg/L	0.0006172	284.74%
QC value within limits for Ni 232.003 A Recovery = Not calculated								
P 213.617 At	1.8	0.001598	mg/L	0.0028713	0.001598	mg/L	0.0028713	179.70%
QC value within limits for P 213.617 A Recovery = Not calculated								
Pb 220.353 At	-0.5	-0.000203	mg/L	0.0005715	-0.000203	mg/L	0.0005715	281.76%
QC value within limits for Pb 220.353 A Recovery = Not calculated								
Sb 206.836 At	1.9	0.002944	mg/L	0.0024923	0.002944	mg/L	0.0024923	84.65%
QC value within limits for Sb 206.836 A Recovery = Not calculated								
Sc 361.383 At	8.3	0.000008	mg/L	0.0000045	0.000008	mg/L	0.0000045	52.61%
QC value within limits for Sc 361.383 A Recovery = Not calculated								
Se 196.026 At	0.4	0.001297	mg/L	0.0048396	0.001297	mg/L	0.0048396	373.15%
QC value within limits for Se 196.026 A Recovery = Not calculated								
Si 251.611 Rt	9.5	0.006194	mg/L	0.0001804	0.006194	mg/L	0.0001804	2.91%
QC value within limits for Si 251.611 R Recovery = Not calculated								
SIO2 251.611 Rt	9.5	0.013256	mg/L	0.0003860	0.013256	mg/L	0.0003860	2.91%

54

QC value within limits for SIO2 251.611 R Recovery = Not calculated							
Sn 189.927 At	-0.5	-0.000529	mg/L	0.0003148	-0.000529	mg/L	0.0003148 59.47%
QC value within limits for Sn 189.927 A Recovery = Not calculated							
Sr 421.552 Rt	3.2	0.000006	mg/L	0.0000112	0.000006	mg/L	0.0000112 187.19%
QC value within limits for Sr 421.552 R Recovery = Not calculated							
Ti 336.121 At	11.1	0.000061	mg/L	0.0000064	0.000061	mg/L	0.0000064 10.53%
QC value within limits for Ti 336.121 A Recovery = Not calculated							
Tl 190.801 At	0.2	0.000336	mg/L	0.0009942	0.000336	mg/L	0.0009942 296.02%
QC value within limits for Tl 190.801 A Recovery = Not calculated							
U 385.958 At	0.5	0.003270	mg/L	0.0161502	0.003270	mg/L	0.0161502 493.85%
V 292.402 At	-4.4	-0.000052	mg/L	0.0000050	-0.000052	mg/L	0.0000050 9.63%
QC value within limits for V 292.402 A Recovery = Not calculated							
Zn 206.200 At	-2.6	-0.000388	mg/L	0.0000017	-0.000388	mg/L	0.0000017 0.43%
QC value within limits for Zn 206.200 A Recovery = Not calculated							
All analyte(s) passed QC.							

55

Sequence No.: 9
Sample ID: CRI
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 7
Date Collected: 4/27/2009 3:27:05 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CRI

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	236041.4	101.839	%	0.1638				0.16%
Lu 261.542 A	1572750.2	100.600	%	0.2709				0.27%
Ag 328.068 At	503.2	0.005304	mg/L	0.0000682	0.005304	mg/L	0.0000682	1.29%
QC value within limits for Ag 328.068 A Recovery = 106.07%								
Al 308.215 Rt	99.4	0.088460	mg/L	0.0018435	0.088460	mg/L	0.0018435	2.08%
QC value within limits for Al 308.215 R Recovery = 110.58%								
As 188.979 At	6.4	0.019384	mg/L	0.0035929	0.019384	mg/L	0.0035929	18.54%
QC value within limits for As 188.979 A Recovery = 77.54%								
B 249.677 Rt	226.4	0.041819	mg/L	0.0002142	0.041819	mg/L	0.0002142	0.51%
QC value within limits for B 249.677 R Recovery = 104.55%								
Ba 233.527 At	56.1	0.002083	mg/L	0.0001105	0.002083	mg/L	0.0001105	5.30%
QC value within limits for Ba 233.527 A Recovery = 104.17%								
Be 313.107 Rt	307.9	0.002048	mg/L	0.0000151	0.002048	mg/L	0.0000151	0.74%
QC value within limits for Be 313.107 R Recovery = 102.42%								
Bi 222.821 At	81.8	0.057880	mg/L	0.0029051	0.057880	mg/L	0.0029051	5.02%
QC value within limits for Bi 222.821 A Recovery = 96.47%								
Ca 315.887 Rt	159.1	0.056018	mg/L	0.0001372	0.056018	mg/L	0.0001372	0.24%
QC value within limits for Ca 315.887 R Recovery = 140.04%								
Cd 226.502 At	48.2	0.001809	mg/L	0.0001150	0.001809	mg/L	0.0001150	6.36%
QC value within limits for Cd 226.502 A Recovery = 90.45%								
Ce 418.660 At	2.0	-0.000162	mg/L	0.0000403	-0.000162	mg/L	0.0000403	24.90%
Co 228.616 At	37.7	0.006095	mg/L	0.0001859	0.006095	mg/L	0.0001859	3.05%
QC value within limits for Co 228.616 A Recovery = 101.59%								
Cr 267.716 At	134.5	0.006492	mg/L	0.0001997	0.006492	mg/L	0.0001997	3.08%
QC value within limits for Cr 267.716 A Recovery = 108.20%								
Cu 324.752 At	1607.1	0.009814	mg/L	0.0000699	0.009814	mg/L	0.0000699	0.71%
QC value within limits for Cu 324.752 A Recovery = 98.14%								
Fe 273.955 Rt	69.1	0.083582	mg/L	0.0000580	0.083582	mg/L	0.0000580	0.07%
QC value within limits for Fe 273.955 R Recovery = 139.30%								
Ga 417.206 At	1438.0	0.019643	mg/L	0.0006270	0.019643	mg/L	0.0006270	3.19%
QC value within limits for Ga 417.206 A Recovery = 98.22%								
K 766.490 Rt	2750.0	0.522652	mg/L	0.0098099	0.522652	mg/L	0.0098099	1.88%
QC value within limits for K 766.490 R Recovery = 104.53%								
La 379.478 At	373.2	0.004452	mg/L	0.0000452	0.004452	mg/L	0.0000452	1.01%
QC value within limits for La 379.478 A Recovery = 89.05%								
Li 670.784 Rt	4113.4	0.022617	mg/L	0.0000299	0.022617	mg/L	0.0000299	0.13%
QC value within limits for Li 670.784 R Recovery = 113.08%								
Mg 279.077 Rt	79.8	0.069072	mg/L	0.0010842	0.069072	mg/L	0.0010842	1.57%
QC value within limits for Mg 279.077 R Recovery = 115.12%								
Mn 260.568 Rt	57.7	0.004144	mg/L	0.0000831	0.004144	mg/L	0.0000831	2.01%
QC value within limits for Mn 260.568 R Recovery = 103.59%								
Mo 202.031 At	40.9	0.008997	mg/L	0.0000129	0.008997	mg/L	0.0000129	0.14%
QC value within limits for Mo 202.031 A Recovery = 112.46%								
Na 589.592 Rt	6316.6	0.526399	mg/L	0.0015757	0.526399	mg/L	0.0015757	0.30%
QC value within limits for Na 589.592 R Recovery = 105.28%								
Ni 232.003 At	60.7	0.009142	mg/L	0.0004689	0.009142	mg/L	0.0004689	5.13%
QC value within limits for Ni 232.003 A Recovery = 91.42%								
P 213.617 At	57.8	0.051878	mg/L	0.0020517	0.051878	mg/L	0.0020517	3.95%
QC value within limits for P 213.617 A Recovery = 103.76%								
Pb 220.353 At	23.0	0.009082	mg/L	0.0013311	0.009082	mg/L	0.0013311	14.66%
QC value within limits for Pb 220.353 A Recovery = 121.10%								
Sb 206.836 At	14.0	0.021404	mg/L	0.0014957	0.021404	mg/L	0.0014957	6.99%
QC value within limits for Sb 206.836 A Recovery = 107.02%								
Sc 361.383 At	1893.5	0.002179	mg/L	0.0000286	0.002179	mg/L	0.0000286	1.31%
QC value within limits for Sc 361.383 A Recovery = 108.93%								
Se 196.026 At	12.7	0.045191	mg/L	0.0047681	0.045191	mg/L	0.0047681	10.55%
QC value within limits for Se 196.026 A Recovery = 112.98%								
Si 251.611 Rt	140.9	0.091373	mg/L	0.0012361	0.091373	mg/L	0.0012361	1.35%
QC value within limits for Si 251.611 R Recovery = 114.22%								
SIO2 251.611 Rt	140.9	0.195544	mg/L	0.0026451	0.195544	mg/L	0.0026451	1.35%

56

QC value within limits for SIO2 251.611 R Recovery = 114.35%							
Sn 189.927 At	49.4	0.054167	mg/L	0.0007997	0.054167	mg/L	0.0007997	1.48%
QC value within limits for Sn 189.927 A Recovery = 108.33%							
Sr 421.552 Rt	2686.6	0.005008	mg/L	0.0000012	0.005008	mg/L	0.0000012	0.02%
QC value within limits for Sr 421.552 R Recovery = 100.17%							
Ti 336.121 At	1003.4	0.005298	mg/L	0.0001407	0.005298	mg/L	0.0001407	2.66%
QC value within limits for Ti 336.121 A Recovery = 105.95%							
Tl 190.801 At	9.2	0.016776	mg/L	0.0009143	0.016776	mg/L	0.0009143	5.45%
QC value within limits for Tl 190.801 A Recovery = 111.84%							
U 385.958 At	4.4	0.026950	mg/L	0.1167221	0.026950	mg/L	0.1167221	433.11%
V 292.402 At	417.6	0.005346	mg/L	0.0000927	0.005346	mg/L	0.0000927	1.73%
QC value within limits for V 292.402 A Recovery = 106.93%							
Zn 206.200 At	71.0	0.010455	mg/L	0.0000345	0.010455	mg/L	0.0000345	0.33%
QC value within limits for Zn 206.200 A Recovery = 104.55%							
All analyte(s) passed QC.							

57

Sequence No.: 10
Sample ID: ICSA
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 8
Date Collected: 4/27/2009 3:32:46 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ICSA

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	226807.1	97.8549	%	0.23732				0.24%
Lu 261.542 A	1407158.5	90.0083	%	0.43074				0.48%
Ag 328.068 At	-1171.7	-0.008508	mg/L	0.0001787	-0.008508	mg/L	0.0001787	2.10%
Al 308.215 Rt	562180.6	500.931	mg/L	0.3559	500.931	mg/L	0.3559	0.07%
QC value within limits for Al 308.215 R Recovery = 100.19%								
As 188.979 At	-10.2	-0.024313	mg/L	0.0067709	-0.024313	mg/L	0.0067709	27.85%
B 249.677 Rt	-114.1	0.002033	mg/L	0.0007059	0.002033	mg/L	0.0007059	34.71%
Ba 233.527 At	340.6	0.005423	mg/L	0.0000064	0.005423	mg/L	0.0000064	0.12%
Be 313.107 Rt	-1.2	0.001550	mg/L	0.0000255	0.001550	mg/L	0.0000255	1.65%
Bi 222.821 At	1214.0	0.335572	mg/L	0.0006342	0.335572	mg/L	0.0006342	0.19%
Ca 315.887 Rt	1361933.9	480.707	mg/L	0.5623	480.707	mg/L	0.5623	0.12%
QC value within limits for Ca 315.887 R Recovery = 96.14%								
Cd 226.502 At	1702.5	0.021944	mg/L	0.0005271	0.021944	mg/L	0.0005271	2.40%
Ce 418.660 At	84.5	-0.040855	mg/L	0.0011199	-0.040855	mg/L	0.0011199	2.74%
Co 228.616 At	175.4	-0.003629	mg/L	0.0005462	-0.003629	mg/L	0.0005462	15.05%
Cr 267.716 At	194563.8	9.38733	mg/L	0.011205	9.38733	mg/L	0.011205	0.12%
QC value within limits for Cr 267.716 A Recovery = 93.87%								
Cu 324.752 At	1930845.3	11.7952	mg/L	0.02491	11.7952	mg/L	0.02491	0.21%
QC value within limits for Cu 324.752 A Recovery = 117.95%								
Fe 273.955 Rt	154832.3	187.094	mg/L	0.0525	187.094	mg/L	0.0525	0.03%
QC value within limits for Fe 273.955 R Recovery = 93.55%								
Ga 417.206 At	3793.4	-0.018940	mg/L	0.0000838	-0.018940	mg/L	0.0000838	0.44%
K 766.490 Rt	131.9	0.008174	mg/L	0.0016674	0.008174	mg/L	0.0016674	20.40%
La 379.478 At	3178.4	0.011123	mg/L	0.0000719	0.011123	mg/L	0.0000719	0.65%
Li 670.784 Rt	807.3	0.004436	mg/L	0.0002539	0.004436	mg/L	0.0002539	5.72%
Mg 279.077 Rt	563712.5	487.882	mg/L	0.1364	487.882	mg/L	0.1364	0.03%
QC value within limits for Mg 279.077 R Recovery = 97.58%								
Mn 260.568 Rt	132295.3	9.48734	mg/L	0.012258	9.48734	mg/L	0.012258	0.13%
QC value within limits for Mn 260.568 R Recovery = 94.87%								
Mo 202.031 At	103.9	0.032183	mg/L	0.0010744	0.032183	mg/L	0.0010744	3.34%
Na 589.592 Rt	257.9	0.021496	mg/L	0.0001143	0.021496	mg/L	0.0001143	0.53%
Ni 232.003 At	72975.0	11.0763	mg/L	0.02787	11.0763	mg/L	0.02787	0.25%
QC value within limits for Ni 232.003 A Recovery = 110.76%								
P 213.617 At	516.2	-0.099601	mg/L	0.0129525	-0.099601	mg/L	0.0129525	13.00%
Pb 220.353 At	-24.7	0.018447	mg/L	0.0001022	0.018447	mg/L	0.0001022	0.55%
Sb 206.836 At	59.5	0.017395	mg/L	0.0009985	0.017395	mg/L	0.0009985	5.74%
Sc 361.383 At	47.1	0.000560	mg/L	0.0000206	0.000560	mg/L	0.0000206	3.67%
Se 196.026 At	-5.8	-0.007402	mg/L	0.0143999	-0.007402	mg/L	0.0143999	194.53%
Si 251.611 Rt	212.2	-0.120122	mg/L	0.0002685	-0.120122	mg/L	0.0002685	0.22%
SIO2 251.611 Rt	212.2	-0.249016	mg/L	0.0005613	-0.249016	mg/L	0.0005613	0.23%
Sn 189.927 At	-49.3	-0.016671	mg/L	0.0046080	-0.016671	mg/L	0.0046080	27.64%
Sr 421.552 Rt	1932.3	0.000083	mg/L	0.0000118	0.000083	mg/L	0.0000118	14.09%
Ti 336.121 At	1744769.0	9.94753	mg/L	0.017276	9.94753	mg/L	0.017276	0.17%
QC value within limits for Ti 336.121 A Recovery = 99.48%								
Tl 190.801 At	16.0	0.021135	mg/L	0.0006751	0.021135	mg/L	0.0006751	3.19%
U 385.958 At	4251.5	25.0656	mg/L	0.11471	25.0656	mg/L	0.11471	0.46%
V 292.402 At	777957.0	9.92668	mg/L	0.006352	9.92668	mg/L	0.006352	0.06%
QC value within limits for V 292.402 A Recovery = 99.27%								
Zn 206.200 At	213.9	0.009820	mg/L	0.0010767	0.009820	mg/L	0.0010767	10.96%

All analyte(s) passed QC.

58

Sequence No.: 11
Sample ID: ICSAB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 9
Date Collected: 4/27/2009 3:38:44 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: ICSAB

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	226532.4	97.7364	%	0.71758				0.73%
Lu 261.542 A	1418888.8	90.7586	%	0.25671				0.28%
Ag 328.068 At	49811.8	0.531913	mg/L	0.0021878	0.531913	mg/L	0.0021878	0.41%
QC value within limits for Ag 328.068 A Recovery = 106.38%								
Al 308.215 Rt	521164.8	464.550	mg/L	0.3484	464.550	mg/L	0.3484	0.08%
QC value within limits for Al 308.215 R Recovery = 92.91%								
As 188.979 At	155.1	0.476517	mg/L	0.0028819	0.476517	mg/L	0.0028819	0.60%
QC value within limits for As 188.979 A Recovery = 95.30%								
B 249.677 Rt	-1.5	0.009902	mg/L	0.0001095	0.009902	mg/L	0.0001095	1.11%
Ba 233.527 At	13031.6	0.478628	mg/L	0.0008237	0.478628	mg/L	0.0008237	0.17%
QC value within limits for Ba 233.527 A Recovery = 95.73%								
Be 313.107 Rt	70583.5	0.470270	mg/L	0.0009055	0.470270	mg/L	0.0009055	0.19%
QC value within limits for Be 313.107 R Recovery = 94.05%								
Bi 222.821 At	867.7	0.294280	mg/L	0.0096929	0.294280	mg/L	0.0096929	3.29%
Ca 315.887 Rt	1285237.4	453.612	mg/L	1.8827	453.612	mg/L	1.8827	0.42%
QC value within limits for Ca 315.887 R Recovery = 90.72%								
Cd 226.502 At	13206.6	0.456122	mg/L	0.0005019	0.456122	mg/L	0.0005019	0.11%
QC value within limits for Cd 226.502 A Recovery = 91.22%								
Ce 418.660 At	237.9	-0.053134	mg/L	0.0005127	-0.053134	mg/L	0.0005127	0.96%
Co 228.616 At	2650.2	0.426887	mg/L	0.0012136	0.426887	mg/L	0.0012136	0.28%
QC value within limits for Co 228.616 A Recovery = 85.38%								
Cr 267.716 At	9981.8	0.483070	mg/L	0.0006683	0.483070	mg/L	0.0006683	0.14%
QC value within limits for Cr 267.716 A Recovery = 96.61%								
Cu 324.752 At	94831.9	0.573460	mg/L	0.0086222	0.573460	mg/L	0.0086222	1.50%
QC value within limits for Cu 324.752 A Recovery = 114.69%								
Fe 273.955 Rt	146075.2	176.547	mg/L	0.5403	176.547	mg/L	0.5403	0.31%
QC value within limits for Fe 273.955 R Recovery = 88.27%								
Ga 417.206 At	2453.3	-0.016751	mg/L	0.0000179	-0.016751	mg/L	0.0000179	0.11%
K 766.490 Rt	113.0	0.005564	mg/L	0.0022523	0.005564	mg/L	0.0022523	40.48%
La 379.478 At	2624.2	0.007309	mg/L	0.0002088	0.007309	mg/L	0.0002088	2.86%
Li 670.784 Rt	765.7	0.004186	mg/L	0.0005026	0.004186	mg/L	0.0005026	12.01%
Mg 279.077 Rt	527135.1	456.195	mg/L	0.7236	456.195	mg/L	0.7236	0.16%
QC value within limits for Mg 279.077 R Recovery = 91.24%								
Mn 260.568 Rt	6354.3	0.435869	mg/L	0.0015632	0.435869	mg/L	0.0015632	0.36%
QC value within limits for Mn 260.568 R Recovery = 87.17%								
Mo 202.031 At	96.7	0.025855	mg/L	0.0001980	0.025855	mg/L	0.0001980	0.77%
Na 589.592 Rt	176.9	0.014739	mg/L	0.0000477	0.014739	mg/L	0.0000477	0.32%
Ni 232.003 At	3086.9	0.522336	mg/L	0.0030035	0.522336	mg/L	0.0030035	0.58%
QC value within limits for Ni 232.003 A Recovery = 104.47%								
P 213.617 At	205.4	0.004901	mg/L	0.0002327	0.004901	mg/L	0.0002327	4.75%
Pb 220.353 At	1164.7	0.477964	mg/L	0.0008128	0.477964	mg/L	0.0008128	0.17%
QC value within limits for Pb 220.353 A Recovery = 95.59%								
Sb 206.836 At	346.1	0.518934	mg/L	0.0043295	0.518934	mg/L	0.0043295	0.83%
QC value within limits for Sb 206.836 A Recovery = 103.79%								
Sc 361.383 At	-104.1	0.000212	mg/L	0.0000105	0.000212	mg/L	0.0000105	4.96%
Se 196.026 At	131.2	0.487105	mg/L	0.0082451	0.487105	mg/L	0.0082451	1.69%
QC value within limits for Se 196.026 A Recovery = 97.42%								
Si 251.611 Rt	154.0	-0.089678	mg/L	0.0000270	-0.089678	mg/L	0.0000270	0.03%
SIO2 251.611 Rt	154.0	-0.191251	mg/L	0.0000571	-0.191251	mg/L	0.0000571	0.03%
Sn 189.927 At	-22.7	-0.014286	mg/L	0.0022661	-0.014286	mg/L	0.0022661	15.86%
Sr 421.552 Rt	1856.3	0.000133	mg/L	0.0000120	0.000133	mg/L	0.0000120	9.03%
Ti 336.121 At	2040.3	-0.000286	mg/L	0.0000145	-0.000286	mg/L	0.0000145	5.05%
Tl 190.801 At	256.9	0.451366	mg/L	0.0009315	0.451366	mg/L	0.0009315	0.21%
QC value within limits for Tl 190.801 A Recovery = 90.27%								
U 385.958 At	3467.7	21.0461	mg/L	0.15657	21.0461	mg/L	0.15657	0.74%
V 292.402 At	36645.8	0.478506	mg/L	0.0015015	0.478506	mg/L	0.0015015	0.31%
QC value within limits for V 292.402 A Recovery = 95.70%								
Zn 206.200 At	3103.6	0.446715	mg/L	0.0020796	0.446715	mg/L	0.0020796	0.47%
QC value within limits for Zn 206.200 A Recovery = 89.34%								

All analyte(s) passed QC.

59

Sequence No.: 12
Sample ID: CCV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 10
Date Collected: 4/27/2009 3:44:38 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCV

Analyte	Mean Corrected Intensity	Calib Conc.	Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Lu 261.542 R	240668.2	103.835	%	0.6342				0.61%
Lu 261.542 A	1593313.6	101.916	%	0.1745				0.17%
Ag 328.068 At	197768.6	2.08626	mg/L	0.001540	2.08626	mg/L	0.001540	0.07%
QC value within limits for Ag 328.068 A Recovery = 104.31%								
Al 308.215 Rt	2283.7	1.97847	mg/L	0.001315	1.97847	mg/L	0.001315	0.07%
QC value within limits for Al 308.215 R Recovery = 98.92%								
As 188.979 At	736.3	2.13138	mg/L	0.003016	2.13138	mg/L	0.003016	0.14%
QC value within limits for As 188.979 A Recovery = 106.57%								
B 249.677 Rt	10775.2	1.99128	mg/L	0.006479	1.99128	mg/L	0.006479	0.33%
QC value within limits for B 249.677 R Recovery = 99.56%								
Ba 233.527 At	55265.3	2.05158	mg/L	0.012840	2.05158	mg/L	0.012840	0.63%
QC value within limits for Ba 233.527 A Recovery = 102.58%								
Be 313.107 Rt	301392.8	2.00322	mg/L	0.007464	2.00322	mg/L	0.007464	0.37%
QC value within limits for Be 313.107 R Recovery = 100.16%								
Bi 222.821 At	5430.6	3.82773	mg/L	0.006250	3.82773	mg/L	0.006250	0.16%
QC value within limits for Bi 222.821 A Recovery = 95.69%								
Ca 315.887 Rt	5775.0	2.02801	mg/L	0.010116	2.02801	mg/L	0.010116	0.50%
QC value within limits for Ca 315.887 R Recovery = 101.40%								
Cd 226.502 At	54701.1	2.07367	mg/L	0.002757	2.07367	mg/L	0.002757	0.13%
QC value within limits for Cd 226.502 A Recovery = 103.68%								
Ce 418.660 At	-606.2	-0.028752	mg/L	0.0002551	-0.028752	mg/L	0.0002551	0.89%
QC value within limits for Ce 418.660 A Recovery = Not calculated								
Co 228.616 At	12621.5	2.04211	mg/L	0.002595	2.04211	mg/L	0.002595	0.13%
QC value within limits for Co 228.616 A Recovery = 102.11%								
Cr 267.716 At	42080.6	2.03066	mg/L	0.001056	2.03066	mg/L	0.001056	0.05%
QC value within limits for Cr 267.716 A Recovery = 101.53%								
Cu 324.752 At	321575.7	1.96521	mg/L	0.003745	1.96521	mg/L	0.003745	0.19%
QC value within limits for Cu 324.752 A Recovery = 98.26%								
Fe 273.955 Rt	1726.7	2.08512	mg/L	0.007941	2.08512	mg/L	0.007941	0.38%
QC value within limits for Fe 273.955 R Recovery = 104.26%								
Ga 417.206 At	283136.6	3.87203	mg/L	0.025071	3.87203	mg/L	0.025071	0.65%
QC value within limits for Ga 417.206 A Recovery = 96.80%								
K 766.490 Rt	101452.5	19.2812	mg/L	0.05276	19.2812	mg/L	0.05276	0.27%
QC value within limits for K 766.490 R Recovery = 96.41%								
La 379.478 At	334595.9	3.99615	mg/L	0.010923	3.99615	mg/L	0.010923	0.27%
QC value within limits for La 379.478 A Recovery = 99.90%								
Li 670.784 Rt	681112.0	3.74480	mg/L	0.018336	3.74480	mg/L	0.018336	0.49%
QC value within limits for Li 670.784 R Recovery = 93.62%								
Mg 279.077 Rt	2320.0	2.01826	mg/L	0.008806	2.01826	mg/L	0.008806	0.44%
QC value within limits for Mg 279.077 R Recovery = 100.91%								
Mn 260.568 Rt	27839.9	1.99997	mg/L	0.000514	1.99997	mg/L	0.000514	0.03%
QC value within limits for Mn 260.568 R Recovery = 100.00%								
Mo 202.031 At	9575.1	2.10467	mg/L	0.002688	2.10467	mg/L	0.002688	0.13%
QC value within limits for Mo 202.031 A Recovery = 105.23%								
Na 589.592 Rt	238367.0	19.8645	mg/L	0.07341	19.8645	mg/L	0.07341	0.37%
QC value within limits for Na 589.592 R Recovery = 99.32%								
Ni 232.003 At	13628.6	2.04660	mg/L	0.005368	2.04660	mg/L	0.005368	0.26%
QC value within limits for Ni 232.003 A Recovery = 102.33%								
P 213.617 At	11468.1	10.3032	mg/L	0.02816	10.3032	mg/L	0.02816	0.27%
QC value within limits for P 213.617 A Recovery = 103.03%								
Pb 220.353 At	5237.9	2.06688	mg/L	0.000532	2.06688	mg/L	0.000532	0.03%
QC value within limits for Pb 220.353 A Recovery = 103.34%								
Sb 206.836 At	1392.7	2.12925	mg/L	0.008040	2.12925	mg/L	0.008040	0.38%
QC value within limits for Sb 206.836 A Recovery = 106.46%								
Sc 361.383 At	839609.2	0.981459	mg/L	0.0003083	0.981459	mg/L	0.0003083	0.03%
QC value within limits for Sc 361.383 A Recovery = 98.15%								
Se 196.026 At	605.5	2.15101	mg/L	0.005447	2.15101	mg/L	0.005447	0.25%
QC value within limits for Se 196.026 A Recovery = 107.55%								
Si 251.611 Rt	15683.2	10.1599	mg/L	0.02031	10.1599	mg/L	0.02031	0.20%
QC value within limits for Si 251.611 R Recovery = 101.60%								

60

SIO2 251.611 R†	15683.2	21.7439	mg/L	0.04347	21.7439	mg/L	0.04347	0.20%
QC value within limits for SIO2 251.611 R Recovery = 101.61%								
Sn 189.927 A†	3761.0	4.12869	mg/L	0.009957	4.12869	mg/L	0.009957	0.24%
QC value within limits for Sn 189.927 A Recovery = 103.22%								
Sr 421.552 R†	1021890.9	1.90524	mg/L	0.003877	1.90524	mg/L	0.003877	0.20%
QC value within limits for Sr 421.552 R Recovery = 95.26%								
Ti 336.121 A†	383001.3	1.99793	mg/L	0.003994	1.99793	mg/L	0.003994	0.20%
QC value within limits for Ti 336.121 A Recovery = 99.90%								
Tl 190.801 A†	1151.8	2.09533	mg/L	0.004912	2.09533	mg/L	0.004912	0.23%
QC value within limits for Tl 190.801 A Recovery = 104.77%								
U 385.958 A†	360.8	1.98351	mg/L	0.043824	1.98351	mg/L	0.043824	2.21%
V 292.402 A†	158263.6	2.01657	mg/L	0.000028	2.01657	mg/L	0.000028	0.00%
QC value within limits for V 292.402 A Recovery = 100.83%								
Zn 206.200 A†	14586.2	2.15021	mg/L	0.007663	2.15021	mg/L	0.007663	0.36%
QC value within limits for Zn 206.200 A Recovery = 107.51%								

All analyte(s) passed QC.

61

Sequence No.: 13
Sample ID: CCB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 1
Date Collected: 4/27/2009 3:50:22 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCB

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	234512.6	101.179	%	0.1311				0.13%
Lu 261.542 A	1585275.9	101.402	%	0.4213				0.42%
Ag 328.068 At	4.6	0.000028	mg/L	0.0001205	0.000028	mg/L	0.0001205	436.73%
QC value within limits for Ag 328.068 A		Recovery = Not calculated						
Al 308.215 Rt	2.9	0.002698	mg/L	0.0007007	0.002698	mg/L	0.0007007	25.97%
QC value within limits for Al 308.215 R		Recovery = Not calculated						
As 188.979 At	-0.4	-0.001340	mg/L	0.0030934	-0.001340	mg/L	0.0030934	230.81%
QC value within limits for As 188.979 A		Recovery = Not calculated						
B 249.677 Rt	1.7	0.000322	mg/L	0.0003704	0.000322	mg/L	0.0003704	115.02%
QC value within limits for B 249.677 R		Recovery = Not calculated						
Ba 233.527 At	-0.2	-0.000005	mg/L	0.0001308	-0.000005	mg/L	0.0001308	>999.9%
QC value within limits for Ba 233.527 A		Recovery = Not calculated						
Be 313.107 Rt	1.7	0.000015	mg/L	0.0000582	0.000015	mg/L	0.0000582	386.54%
QC value within limits for Be 313.107 R		Recovery = Not calculated						
Bi 222.821 At	11.7	0.008280	mg/L	0.0017534	0.008280	mg/L	0.0017534	21.18%
QC value within limits for Bi 222.821 A		Recovery = Not calculated						
Ca 315.887 Rt	5.0	0.001639	mg/L	0.0008705	0.001639	mg/L	0.0008705	53.13%
QC value within limits for Ca 315.887 R		Recovery = Not calculated						
Cd 226.502 At	-8.6	-0.000325	mg/L	0.0000786	-0.000325	mg/L	0.0000786	24.19%
QC value within limits for Cd 226.502 A		Recovery = Not calculated						
Ce 418.660 At	-8.1	-0.000234	mg/L	0.0002857	-0.000234	mg/L	0.0002857	122.26%
Co 228.616 At	-2.3	-0.000382	mg/L	0.0001647	-0.000382	mg/L	0.0001647	43.11%
QC value within limits for Co 228.616 A		Recovery = Not calculated						
Cr 267.716 At	-1.1	-0.000041	mg/L	0.0002393	-0.000041	mg/L	0.0002393	581.25%
QC value within limits for Cr 267.716 A		Recovery = Not calculated						
Cu 324.752 At	460.6	0.002806	mg/L	0.0003379	0.002806	mg/L	0.0003379	12.04%
QC value within limits for Cu 324.752 A		Recovery = Not calculated						
Fe 273.955 Rt	5.2	0.006420	mg/L	0.0000480	0.006420	mg/L	0.0000480	0.75%
QC value within limits for Fe 273.955 R		Recovery = Not calculated						
Ga 417.206 At	-16.6	-0.000286	mg/L	0.0000625	-0.000286	mg/L	0.0000625	21.88%
QC value within limits for Ga 417.206 A		Recovery = Not calculated						
K 766.490 Rt	44.2	0.008402	mg/L	0.0009407	0.008402	mg/L	0.0009407	11.20%
QC value within limits for K 766.490 R		Recovery = Not calculated						
La 379.478 At	5.9	0.000071	mg/L	0.0000488	0.000071	mg/L	0.0000488	68.53%
QC value within limits for La 379.478 A		Recovery = Not calculated						
Li 670.784 Rt	269.8	0.001484	mg/L	0.0001672	0.001484	mg/L	0.0001672	11.27%
QC value within limits for Li 670.784 R		Recovery = Not calculated						
Mg 279.077 Rt	7.3	0.006403	mg/L	0.0013468	0.006403	mg/L	0.0013468	21.04%
QC value within limits for Mg 279.077 R		Recovery = Not calculated						
Mn 260.568 Rt	-1.3	-0.000092	mg/L	0.0001384	-0.000092	mg/L	0.0001384	151.12%
QC value within limits for Mn 260.568 R		Recovery = Not calculated						
Mo 202.031 At	-0.8	-0.000122	mg/L	0.0006013	-0.000122	mg/L	0.0006013	492.06%
QC value within limits for Mo 202.031 A		Recovery = Not calculated						
Na 589.592 Rt	11.4	0.000947	mg/L	0.0001665	0.000947	mg/L	0.0001665	17.57%
QC value within limits for Na 589.592 R		Recovery = Not calculated						
Ni 232.003 At	4.7	0.000702	mg/L	0.0003149	0.000702	mg/L	0.0003149	44.84%
QC value within limits for Ni 232.003 A		Recovery = Not calculated						
P 213.617 At	3.9	0.003425	mg/L	0.0004592	0.003425	mg/L	0.0004592	13.41%
QC value within limits for P 213.617 A		Recovery = Not calculated						
Pb 220.353 At	-4.1	-0.001629	mg/L	0.0013451	-0.001629	mg/L	0.0013451	82.59%
QC value within limits for Pb 220.353 A		Recovery = Not calculated						
Sb 206.836 At	1.3	0.001909	mg/L	0.0013843	0.001909	mg/L	0.0013843	72.51%
QC value within limits for Sb 206.836 A		Recovery = Not calculated						
Sc 361.383 At	10.3	0.000009	mg/L	0.0000075	0.000009	mg/L	0.0000075	88.69%
QC value within limits for Sc 361.383 A		Recovery = Not calculated						
Se 196.026 At	1.3	0.004771	mg/L	0.0026924	0.004771	mg/L	0.0026924	56.43%
QC value within limits for Se 196.026 A		Recovery = Not calculated						
Si 251.611 Rt	7.8	0.005128	mg/L	0.0003645	0.005128	mg/L	0.0003645	7.11%
QC value within limits for Si 251.611 R		Recovery = Not calculated						
SIO2 251.611 Rt	7.8	0.010973	mg/L	0.0007801	0.010973	mg/L	0.0007801	7.11%

62

QC value within limits for SIO2 251.611 R Recovery = Not calculated

Sn 189.927 At	-1.0	-0.001076	mg/L	0.0006884	-0.001076	mg/L	0.0006884 63.98%
QC value within limits for Sn 189.927 A Recovery = Not calculated							
Sr 421.552 Rt	5.4	0.000010	mg/L	0.0000200	0.000010	mg/L	0.0000200 199.09%
QC value within limits for Sr 421.552 R Recovery = Not calculated							
Ti 336.121 At	23.3	0.000123	mg/L	0.0000172	0.000123	mg/L	0.0000172 13.98%
QC value within limits for Ti 336.121 A Recovery = Not calculated							
Tl 190.801 At	0.8	0.001441	mg/L	0.0018498	0.001441	mg/L	0.0018498 128.33%
QC value within limits for Tl 190.801 A Recovery = Not calculated							
U 385.958 At	6.0	0.038929	mg/L	0.0858525	0.038929	mg/L	0.0858525 220.54%
V 292.402 At	15.7	0.000242	mg/L	0.0002813	0.000242	mg/L	0.0002813 116.36%
QC value within limits for V 292.402 A Recovery = Not calculated							
Zn 206.200 At	-10.2	-0.001511	mg/L	0.0001408	-0.001511	mg/L	0.0001408 9.32%
QC value within limits for Zn 206.200 A Recovery = Not calculated							

All analyte(s) passed QC.

63

Analysis Begun

Start Time: 4/27/2009 3:57:16 PM
Logged In Analyst: optima6
Spectrometer Model: Optima 5300 DV, S/N 077N6062101
Plasma On Time: 4/27/2009 2:05:29 PM
Technique: ICP Continuous
Autosampler Model: AS-93plus

Sample Information File: C:\pe\5300dv\Sample Information\START.sif
Batch ID: W917173
Results Data Set: 09117A
Results Library: C:\pe\5300dv\Results\Results.mdb

Method Loaded
Method Name: OPT6
IEC File: OPTIMA6.iec
Method Description:
Method Last Saved: 4/27/2009 2:51:17 PM
MSF File:

Sequence No.: 1
Sample ID: W917173-BLK1
Analyst:
Initial Sample Wt:
Dilution:
Autosampler Location: 101
Date Collected: 4/27/2009 3:57:16 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W917173-BLK1

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	237145.7	102.315	%	0.7699				0.75%
Lu 261.542 A	1594094.6	101.966	%	0.2998				0.29%
Ag 328.068 At	4.0	0.000073	mg/L	0.0001108	0.000073	mg/L	0.0001108	152.70%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	1.4	0.001130	mg/L	0.0017241	0.001130	mg/L	0.0017241	152.59%
QC value within limits for Al 308.215 R Recovery = Not calculated								
As 188.979 At	-1.1	-0.003483	mg/L	0.0000579	-0.003483	mg/L	0.0000579	1.66%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	0.1	0.000013	mg/L	0.0005904	0.000013	mg/L	0.0005904	>999.9%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	5.6	0.000205	mg/L	0.0000183	0.000205	mg/L	0.0000183	8.95%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	-3.2	-0.000027	mg/L	0.0000128	-0.000027	mg/L	0.0000128	48.13%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	7.7	0.005469	mg/L	0.0011156	0.005469	mg/L	0.0011156	20.40%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	33.9	0.012184	mg/L	0.0020584	0.012184	mg/L	0.0020584	16.89%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	-4.1	-0.000158	mg/L	0.0000256	-0.000158	mg/L	0.0000256	16.18%
QC value within limits for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	0.1	0.000095	mg/L	0.0001083	0.000095	mg/L	0.0001083	113.60%
Co 228.616 At	1.4	0.000236	mg/L	0.0003860	0.000236	mg/L	0.0003860	163.55%
QC value within limits for Co 228.616 A Recovery = Not calculated								
Cr 267.716 At	0.4	0.000006	mg/L	0.0000120	0.000006	mg/L	0.0000120	185.30%
QC value within limits for Cr 267.716 A Recovery = Not calculated								
Cu 324.752 At	248.2	0.001527	mg/L	0.0002019	0.001527	mg/L	0.0002019	13.23%
QC value within limits for Cu 324.752 A Recovery = Not calculated								
Fe 273.955 Rt	4.9	0.005846	mg/L	0.0007943	0.005846	mg/L	0.0007943	13.59%
QC value within limits for Fe 273.955 R Recovery = Not calculated								
Ga 417.206 At	-8.1	-0.000024	mg/L	0.0002612	-0.000024	mg/L	0.0002612	>999.9%
QC value within limits for Ga 417.206 A Recovery = Not calculated								
K 766.490 Rt	25.2	0.004791	mg/L	0.0029499	0.004791	mg/L	0.0029499	61.58%
QC value within limits for K 766.490 R Recovery = Not calculated								
La 379.478 At	6.1	0.000072	mg/L	0.0000137	0.000072	mg/L	0.0000137	18.96%
QC value within limits for La 379.478 A Recovery = Not calculated								
Li 670.784 Rt	187.7	0.001032	mg/L	0.0000102	0.001032	mg/L	0.0000102	0.99%
QC value within limits for Li 670.784 R Recovery = Not calculated								
Mg 279.077 Rt	3.6	0.002933	mg/L	0.0004910	0.002933	mg/L	0.0004910	16.74%
QC value within limits for Mg 279.077 R Recovery = Not calculated								
Mn 260.568 Rt	-0.2	-0.000016	mg/L	0.0001059	-0.000016	mg/L	0.0001059	647.24%
QC value within limits for Mn 260.568 R Recovery = Not calculated								
Mo 202.031 At	-0.8	-0.000247	mg/L	0.0002036	-0.000247	mg/L	0.0002036	82.28%

64

QC value within limits for Mo 202.031 A Recovery = Not calculated							
Na 589.592 Rt	-1.3	-0.000106	mg/L	0.0003644	-0.000106	mg/L	0.0003644 344.12%
QC value within limits for Na 589.592 R Recovery = Not calculated							
Ni 232.003 At	8.8	0.001396	mg/L	0.0000482	0.001396	mg/L	0.0000482 3.45%
QC value within limits for Ni 232.003 A Recovery = Not calculated							
P 213.617 At	2.6	0.002283	mg/L	0.0023766	0.002283	mg/L	0.0023766 104.11%
QC value within limits for P 213.617 A Recovery = Not calculated							
Pb 220.353 At	-7.8	-0.003025	mg/L	0.0000641	-0.003025	mg/L	0.0000641 2.12%
QC value within limits for Pb 220.353 A Recovery = Not calculated							
Sb 206.836 At	-1.0	-0.001536	mg/L	0.0013730	-0.001536	mg/L	0.0013730 89.37%
QC value within limits for Sb 206.836 A Recovery = Not calculated							
Sc 361.383 At	1.6	-0.000001	mg/L	0.0000063	-0.000001	mg/L	0.0000063 481.03%
QC value within limits for Sc 361.383 A Recovery = Not calculated							
Se 196.026 At	0.8	0.002623	mg/L	0.0044914	0.002623	mg/L	0.0044914 171.20%
QC value within limits for Se 196.026 A Recovery = Not calculated							
Si 251.611 Rt	8.9	0.005825	mg/L	0.0000422	0.005825	mg/L	0.0000422 0.72%
QC value within limits for Si 251.611 R Recovery = Not calculated							
SIO2 251.611 Rt	8.9	0.012465	mg/L	0.0000903	0.012465	mg/L	0.0000903 0.72%
QC value within limits for SIO2 251.611 R Recovery = Not calculated							
Sn 189.927 At	-1.0	-0.001083	mg/L	0.0015869	-0.001083	mg/L	0.0015869 146.54%
QC value within limits for Sn 189.927 A Recovery = Not calculated							
Sr 421.552 Rt	6.3	0.000012	mg/L	0.0000099	0.000012	mg/L	0.0000099 84.89%
QC value within limits for Sr 421.552 R Recovery = Not calculated							
Ti 336.121 At	77.7	0.000454	mg/L	0.0001019	0.000454	mg/L	0.0001019 22.46%
QC value within limits for Ti 336.121 A Recovery = Not calculated							
Tl 190.801 At	0.3	0.000583	mg/L	0.0029365	0.000583	mg/L	0.0029365 503.88%
QC value within limits for Tl 190.801 A Recovery = Not calculated							
U 385.958 At	-8.6	-0.055847	mg/L	0.0231610	-0.055847	mg/L	0.0231610 41.47%
V 292.402 At	21.4	0.000210	mg/L	0.0000563	0.000210	mg/L	0.0000563 26.82%
QC value within limits for V 292.402 A Recovery = Not calculated							
Zn 206.200 At	-5.0	-0.000746	mg/L	0.0001545	-0.000746	mg/L	0.0001545 20.71%
QC value within limits for Zn 206.200 A Recovery = Not calculated							
All analyte(s) passed QC.							

65

Sequence No.: 2
Sample ID: W917173-BS1
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 102
Date Collected: 4/27/2009 4:02:59 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W917173-BS1

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	237469.1	102.455	%	0.2526				0.25%
Lu 261.542 A	1591179.2	101.779	%	0.4029				0.40%
Ag 328.068 At	4948.4	0.052348	mg/L	0.0003999	0.052348	mg/L	0.0003999	0.76%
QC value within limits for Ag 328.068 A Recovery = 104.70%								
Al 308.215 Rt	1157.6	1.00372	mg/L	0.009965	1.00372	mg/L	0.009965	0.99%
QC value within limits for Al 308.215 R Recovery = 100.37%								
As 188.979 At	352.9	1.04999	mg/L	0.010876	1.04999	mg/L	0.010876	1.04%
QC value within limits for As 188.979 A Recovery = 105.00%								
B 249.677 Rt	5394.8	0.997457	mg/L	0.0055010	0.997457	mg/L	0.0055010	0.55%
QC value within limits for B 249.677 R Recovery = 99.75%								
Ba 233.527 At	27367.8	1.01568	mg/L	0.005416	1.01568	mg/L	0.005416	0.53%
QC value within limits for Ba 233.527 A Recovery = 101.57%								
Be 313.107 Rt	150340.6	0.999231	mg/L	0.0009460	0.999231	mg/L	0.0009460	0.09%
QC value within limits for Be 313.107 R Recovery = 99.92%								
Bi 222.821 At	1392.7	0.956516	mg/L	0.0168681	0.956516	mg/L	0.0168681	1.76%
QC value within limits for Bi 222.821 A Recovery = 95.65%								
Ca 315.887 Rt	56406.8	19.9043	mg/L	0.00494	19.9043	mg/L	0.00494	0.02%
QC value within limits for Ca 315.887 R Recovery = 99.52%								
Cd 226.502 At	27032.8	1.02237	mg/L	0.003245	1.02237	mg/L	0.003245	0.32%
QC value within limits for Cd 226.502 A Recovery = 102.24%								
Ce 418.660 At	-251.0	-0.011404	mg/L	0.0005885	-0.011404	mg/L	0.0005885	5.16%
Co 228.616 At	6240.7	1.00965	mg/L	0.000299	1.00965	mg/L	0.000299	0.03%
QC value within limits for Co 228.616 A Recovery = 100.97%								
Cr 267.716 At	20601.0	0.994055	mg/L	0.0046970	0.994055	mg/L	0.0046970	0.47%
QC value within limits for Cr 267.716 A Recovery = 99.41%								
Cu 324.752 At	159653.5	0.975525	mg/L	0.0002519	0.975525	mg/L	0.0002519	0.03%
QC value within limits for Cu 324.752 A Recovery = 97.55%								
Fe 273.955 Rt	8148.5	9.84603	mg/L	0.080822	9.84603	mg/L	0.080822	0.82%
QC value within limits for Fe 273.955 R Recovery = 98.46%								
Ga 417.206 At	70927.2	0.967268	mg/L	0.0005129	0.967268	mg/L	0.0005129	0.05%
QC value within limits for Ga 417.206 A Recovery = 96.73%								
K 766.490 Rt	104294.1	19.8207	mg/L	0.12123	19.8207	mg/L	0.12123	0.61%
QC value within limits for K 766.490 R Recovery = 99.10%								
La 379.478 At	82058.4	0.978965	mg/L	0.0003506	0.978965	mg/L	0.0003506	0.04%
QC value within limits for La 379.478 A Recovery = 97.90%								
Li 670.784 Rt	178342.5	0.980516	mg/L	0.0048280	0.980516	mg/L	0.0048280	0.49%
QC value within limits for Li 670.784 R Recovery = 98.05%								
Mg 279.077 Rt	23162.5	20.0480	mg/L	0.04897	20.0480	mg/L	0.04897	0.24%
QC value within limits for Mg 279.077 R Recovery = 100.24%								
Mn 260.568 Rt	13817.9	0.991715	mg/L	0.0006202	0.991715	mg/L	0.0006202	0.06%
QC value within limits for Mn 260.568 R Recovery = 99.17%								
Mo 202.031 At	4779.1	1.04998	mg/L	0.008033	1.04998	mg/L	0.008033	0.77%
QC value within limits for Mo 202.031 A Recovery = 105.00%								
Na 589.592 Rt	226906.6	18.9094	mg/L	0.08874	18.9094	mg/L	0.08874	0.47%
QC value within limits for Na 589.592 R Recovery = 99.52%								
Ni 232.003 At	6496.7	0.977006	mg/L	0.0003385	0.977006	mg/L	0.0003385	0.03%
QC value within limits for Ni 232.003 A Recovery = 97.70%								
P 213.617 At	1146.4	1.00555	mg/L	0.008855	1.00555	mg/L	0.008855	0.88%
QC value within limits for P 213.617 A Recovery = 100.55%								
Pb 220.353 At	2619.7	1.03376	mg/L	0.007749	1.03376	mg/L	0.007749	0.75%
QC value within limits for Pb 220.353 A Recovery = 103.38%								
Sb 206.836 At	685.4	1.04653	mg/L	0.008516	1.04653	mg/L	0.008516	0.81%
QC value within limits for Sb 206.836 A Recovery = 104.65%								
Sc 361.383 At	413343.9	0.483208	mg/L	0.0017319	0.483208	mg/L	0.0017319	0.36%
QC value within limits for Sc 361.383 A Recovery = 96.64%								
Se 196.026 At	297.4	1.05742	mg/L	0.002659	1.05742	mg/L	0.002659	0.25%
QC value within limits for Se 196.026 A Recovery = 105.74%								
Si 251.611 Rt	7542.2	4.88300	mg/L	0.020742	4.88300	mg/L	0.020742	0.42%
QC value within limits for Si 251.611 R Recovery = 97.66%								
SIO2 251.611 Rt	7542.2	10.4504	mg/L	0.04439	10.4504	mg/L	0.04439	0.42%

QC value within limits for SIO2 251.611 R Recovery = 97.67%							
Sn 189.927 At	957.7	1.05320	mg/L	0.009668	1.05320	mg/L	0.009668	0.92%
QC value within limits for Sn 189.927 A Recovery = 105.32%							
Sr 421.552 Rt	521035.7	0.971295	mg/L	0.0009857	0.971295	mg/L	0.0009857	0.10%
QC value within limits for Sr 421.552 R Recovery = 97.13%							
Ti 336.121 At	189680.3	0.989643	mg/L	0.0022499	0.989643	mg/L	0.0022499	0.23%
QC value within limits for Ti 336.121 A Recovery = 98.96%							
Tl 190.801 At	573.5	1.04282	mg/L	0.003915	1.04282	mg/L	0.003915	0.38%
QC value within limits for Tl 190.801 A Recovery = 104.28%							
U 385.958 At	249.9	1.36917	mg/L	0.062241	1.36917	mg/L	0.062241	4.55%
V 292.402 At	77815.2	0.991791	mg/L	0.0019786	0.991791	mg/L	0.0019786	0.20%
QC value within limits for V 292.402 A Recovery = 99.18%							
Zn 206.200 At	7165.0	1.05606	mg/L	0.008320	1.05606	mg/L	0.008320	0.79%
QC value within limits for Zn 206.200 A Recovery = 105.61%							

All analyte(s) passed QC.

67

Sequence No.: 3
Sample ID: W9D0298-01
Analyst: DG
Initial Sample Wt:
Dilution:

Autosampler Location: 103
Date Collected: 4/27/2009 4:09:00 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W9D0298-01

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	237124.0	102.306	%	0.5883				0.58%
Lu 261.542 A	1594680.4	102.003	%	0.3724				0.37%
Ag 328.068 At	1.3	-0.000015	mg/L	0.0001073	-0.000015	mg/L	0.0001073	712.52%
Al 308.215 Rt	5.1	0.004761	mg/L	0.0007103	0.004761	mg/L	0.0007103	14.92%
As 188.979 At	-1.7	-0.005490	mg/L	0.0009546	-0.005490	mg/L	0.0009546	17.39%
B 249.677 Rt	165.3	0.030667	mg/L	0.0005270	0.030667	mg/L	0.0005270	1.72%
Ba 233.527 At	239.9	0.008911	mg/L	0.0000005	0.008911	mg/L	0.0000005	0.01%
Be 313.107 Rt	-4.8	-0.000018	mg/L	0.0000089	-0.000018	mg/L	0.0000089	49.40%
Bi 222.821 At	3.6	0.002551	mg/L	0.0004351	0.002551	mg/L	0.0004351	17.05%
Ca 315.887 Rt	81770.7	28.8603	mg/L	0.02960	28.8603	mg/L	0.02960	0.10%
Cd 226.502 At	2.0	0.000013	mg/L	0.0000190	0.000013	mg/L	0.0000190	149.19%
Ce 418.660 At	-1.2	-0.002012	mg/L	0.0001692	-0.002012	mg/L	0.0001692	8.41%
Co 228.616 At	-5.1	-0.000845	mg/L	0.0000776	-0.000845	mg/L	0.0000776	9.19%
Cr 267.716 At	4.3	0.000240	mg/L	0.0001571	0.000240	mg/L	0.0001571	65.51%
Cu 324.752 At	164.2	0.000959	mg/L	0.0000515	0.000959	mg/L	0.0000515	5.37%
Fe 273.955 Rt	5.1	0.006466	mg/L	0.0020341	0.006466	mg/L	0.0020341	31.46%
Ga 417.206 At	-12.9	-0.000404	mg/L	0.0000059	-0.000404	mg/L	0.0000059	1.47%
K 766.490 Rt	9192.4	1.74706	mg/L	0.017657	1.74706	mg/L	0.017657	1.01%
La 379.478 At	785.1	0.008134	mg/L	0.0000445	0.008134	mg/L	0.0000445	0.55%
Li 670.784 Rt	893.7	0.004914	mg/L	0.0001515	0.004914	mg/L	0.0001515	3.08%
Mg 279.077 Rt	3954.2	3.42291	mg/L	0.015506	3.42291	mg/L	0.015506	0.45%
Mn 260.568 Rt	4.4	0.000114	mg/L	0.0000656	0.000114	mg/L	0.0000656	57.46%
Mo 202.031 At	25.9	0.005346	mg/L	0.0007510	0.005346	mg/L	0.0007510	14.05%
Na 589.592 Rt	96054.1	8.00474	mg/L	0.020017	8.00474	mg/L	0.020017	0.25%
Ni 232.003 At	8.2	0.001143	mg/L	0.0005236	0.001143	mg/L	0.0005236	45.79%
P 213.617 At	1.1	0.002347	mg/L	0.0020055	0.002347	mg/L	0.0020055	85.46%
Pb 220.353 At	-6.1	-0.002153	mg/L	0.0002758	-0.002153	mg/L	0.0002758	12.81%
Sb 206.836 At	1.6	0.002314	mg/L	0.0004579	0.002314	mg/L	0.0004579	19.79%
Sc 361.383 At	-40.1	-0.000037	mg/L	0.0000043	-0.000037	mg/L	0.0000043	11.54%
Se 196.026 At	-4.0	-0.012303	mg/L	0.0041569	-0.012303	mg/L	0.0041569	33.79%
Si 251.611 Rt	12616.0	8.22502	mg/L	0.003445	8.22502	mg/L	0.003445	0.04%
SIO2 251.611 Rt	12616.0	17.6015	mg/L	0.00737	17.6015	mg/L	0.00737	0.04%
Sn 189.927 At	-0.3	-0.000010	mg/L	0.0026076	-0.000010	mg/L	0.0026076	>999.9%
Sr 421.552 Rt	96023.3	0.178821	mg/L	0.0001848	0.178821	mg/L	0.0001848	0.10%
Ti 336.121 At	86.5	0.000200	mg/L	0.0000362	0.000200	mg/L	0.0000362	18.09%
Tl 190.801 At	2.5	0.003963	mg/L	0.0015469	0.003963	mg/L	0.0015469	39.03%
U 385.958 At	21.5	0.140478	mg/L	0.0245594	0.140478	mg/L	0.0245594	17.48%
V 292.402 At	222.0	0.002847	mg/L	0.0000649	0.002847	mg/L	0.0000649	2.28%
Zn 206.200 At	-17.2	-0.002590	mg/L	0.0000849	-0.002590	mg/L	0.0000849	3.28%

Sequence No.: 4
Sample ID: W917173-MS1
Analyst: DG
Initial Sample Wt:
Dilution:

Autosampler Location: 104
Date Collected: 4/27/2009 4:14:40 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W917173-MS1

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	234702.5	101.261	%	0.1524				0.15%
Lu 261.542 A	1562757.1	99.9611	%	0.08837				0.09%
Ag 328.068 At	4950.2	0.052329	mg/L	0.0000373	0.052329	mg/L	0.0000373	0.07%
Al 308.215 Rt	1166.0	1.01168	mg/L	0.006669	1.01168	mg/L	0.006669	0.66%
As 188.979 At	346.6	1.03048	mg/L	0.013378	1.03048	mg/L	0.013378	1.30%
B 249.677 Rt	5609.3	1.03719	mg/L	0.000177	1.03719	mg/L	0.000177	0.02%
Ba 233.527 At	27138.8	1.00719	mg/L	0.002672	1.00719	mg/L	0.002672	0.27%
Be 313.107 Rt	151725.3	1.00845	mg/L	0.005051	1.00845	mg/L	0.005051	0.50%
Bi 222.821 At	1394.3	0.958181	mg/L	0.0042779	0.958181	mg/L	0.0042779	0.45%
Ca 315.887 Rt	138177.1	48.7643	mg/L	0.10293	48.7643	mg/L	0.10293	0.21%
Cd 226.502 At	26583.9	1.00531	mg/L	0.000978	1.00531	mg/L	0.000978	0.10%
Ce 418.660 At	-248.6	-0.013406	mg/L	0.0001437	-0.013406	mg/L	0.0001437	1.07%
Co 228.616 At	6180.2	0.999808	mg/L	0.0022750	0.999808	mg/L	0.0022750	0.23%
Cr 267.716 At	20262.6	0.977774	mg/L	0.0008022	0.977774	mg/L	0.0008022	0.08%
Cu 324.752 At	163455.5	0.998703	mg/L	0.0044448	0.998703	mg/L	0.0044448	0.45%
Fe 273.955 Rt	8131.7	9.82610	mg/L	0.018631	9.82610	mg/L	0.018631	0.19%
Ga 417.206 At	71882.5	0.980121	mg/L	0.0027405	0.980121	mg/L	0.0027405	0.28%
K 766.490 Rt	114327.1	21.7275	mg/L	0.04042	21.7275	mg/L	0.04042	0.19%
La 379.478 At	81956.8	0.976508	mg/L	0.0038210	0.976508	mg/L	0.0038210	0.39%
Li 670.784 Rt	180222.5	0.990854	mg/L	0.0016922	0.990854	mg/L	0.0016922	0.17%
Mg 279.077 Rt	27304.6	23.6336	mg/L	0.02638	23.6336	mg/L	0.02638	0.11%
Mn 260.568 Rt	13869.4	0.995217	mg/L	0.0006643	0.995217	mg/L	0.0006643	0.07%
Mo 202.031 At	4767.1	1.04703	mg/L	0.002378	1.04703	mg/L	0.002378	0.23%
Na 589.592 Rt	328334.5	27.3620	mg/L	0.18727	27.3620	mg/L	0.18727	0.68%
Ni 232.003 At	6527.2	0.981983	mg/L	0.0033879	0.981983	mg/L	0.0033879	0.35%
P 213.617 At	1125.6	0.987295	mg/L	0.0092806	0.987295	mg/L	0.0092806	0.94%
Pb 220.353 At	2583.8	1.01982	mg/L	0.002108	1.01982	mg/L	0.002108	0.21%
Sb 206.836 At	681.6	1.04061	mg/L	0.003051	1.04061	mg/L	0.003051	0.29%
Sc 361.383 At	412729.1	0.482500	mg/L	0.0002266	0.482500	mg/L	0.0002266	0.05%
Se 196.026 At	292.3	1.04123	mg/L	0.005903	1.04123	mg/L	0.005903	0.57%
Si 251.611 Rt	20439.7	13.2917	mg/L	0.00179	13.2917	mg/L	0.00179	0.01%
SIO2 251.611 Rt	20439.7	28.4449	mg/L	0.00384	28.4449	mg/L	0.00384	0.01%
Sn 189.927 At	963.1	1.05942	mg/L	0.009054	1.05942	mg/L	0.009054	0.85%
Sr 421.552 Rt	621558.6	1.15851	mg/L	0.008219	1.15851	mg/L	0.008219	0.71%
Ti 336.121 At	189763.8	0.989950	mg/L	0.0009357	0.989950	mg/L	0.0009357	0.09%
Tl 190.801 At	576.9	1.04849	mg/L	0.003139	1.04849	mg/L	0.003139	0.30%
U 385.958 At	272.9	1.52054	mg/L	0.042152	1.52054	mg/L	0.042152	2.77%
V 292.402 At	77387.8	0.986358	mg/L	0.0013282	0.986358	mg/L	0.0013282	0.13%
Zn 206.200 At	6970.9	1.02735	mg/L	0.000859	1.02735	mg/L	0.000859	0.08%

Matrix Recovery Check: W917173-MS1

Analyte	Expected Conc.	Measured Conc.	Std. Dev.	Units	Recovery (%)
Al 308.215 R	1.00476	1.01168	0.007	mg/L	100.7
B 249.677 R	1.03067	1.03719	0.000	mg/L	100.7
Be 313.107 R	0.999982	1.00845	0.005	mg/L	100.8
Ca 315.887 R	48.8603	48.7643	0.103	mg/L	99.5
Fe 273.955 R	10.0065	9.82610	0.019	mg/L	98.2
K 766.490 R	21.7471	21.7275	0.040	mg/L	99.9
Li 670.784 R	1.00491	0.990854	0.002	mg/L	98.6
Mg 279.077 R	23.4229	23.6336	0.026	mg/L	101.1
Mn 260.568 R	1.00011	0.995217	0.001	mg/L	99.5
Na 589.592 R	27.0047	27.3620	0.187	mg/L	101.9
Si 251.611 R	13.2250	13.2917	0.002	mg/L	101.3
SIO2 251.611 R	28.3015	28.4449	0.004	mg/L	101.3
Sr 421.552 R	1.17882	1.15851	0.008	mg/L	98.0
Ag 328.068 A	0.049985	0.052329	0.000	mg/L	104.7
As 188.979 A	0.994510	1.03048	0.013	mg/L	103.6
Ba 233.527 A	1.00891	1.00719	0.003	mg/L	99.8

69

Bi 222.821 A	1.00255	0.958181	0.004	mg/L	95.6
Cd 226.502 A	1.00001	1.00531	0.001	mg/L	100.5
Co 228.616 A	0.999155	0.999808	0.002	mg/L	100.1
Cr 267.716 A	1.00024	0.977774	0.001	mg/L	97.8
Cu 324.752 A	1.00096	0.998703	0.004	mg/L	99.8
Ga 417.206 A	0.999596	0.980121	0.003	mg/L	98.1
La 379.478 A	1.00813	0.976508	0.004	mg/L	96.8
Mo 202.031 A	1.00535	1.04703	0.002	mg/L	104.2
Ni 232.003 A	1.00114	0.981983	0.003	mg/L	98.1
P 213.617 A	1.00235	0.987295	0.009	mg/L	98.5
Pb 220.353 A	0.997847	1.01982	0.002	mg/L	102.2
Sb 206.836 A	1.00231	1.04061	0.003	mg/L	103.8
Sc 361.383 A	0.499963	0.482500	0.000	mg/L	96.5
Se 196.026 A	0.987697	1.04123	0.006	mg/L	105.4
Sn 189.927 A	0.999990	1.05942	0.009	mg/L	105.9
Ti 336.121 A	1.00020	0.989950	0.001	mg/L	99.0
Tl 190.801 A	1.00396	1.04849	0.003	mg/L	104.5
U 385.958 A	1.14048	1.52054	0.042	mg/L	138.0
V 292.402 A	1.00285	0.986358	0.001	mg/L	98.4
Zn 206.200 A	0.997410	1.02735	0.001	mg/L	103.0

70

Sequence No.: 5
Sample ID: W917173-MSD1
Analyst: DG
Initial Sample Wt:
Dilution:

Autosampler Location: 105
Date Collected: 4/27/2009 4:20:48 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: W917173-MSD1

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	232764.7	100.425	%	0.1940				0.19%
Lu 261.542 A	1552069.7	99.2775	%	0.01475				0.01%
Ag 328.068 At	4952.8	0.052325	mg/L	0.0000091	0.052325	mg/L	0.0000091	0.02%
Al 308.215 Rt	1165.9	1.01155	mg/L	0.011921	1.01155	mg/L	0.011921	1.18%
As 188.979 At	349.0	1.03786	mg/L	0.004228	1.03786	mg/L	0.004228	0.41%
B 249.677 Rt	5557.7	1.02768	mg/L	0.007525	1.02768	mg/L	0.007525	0.73%
Ba 233.527 At	27230.0	1.01058	mg/L	0.003496	1.01058	mg/L	0.003496	0.35%
Be 313.107 Rt	150079.6	0.997514	mg/L	0.0007324	0.997514	mg/L	0.0007324	0.07%
Bi 222.821 At	1407.3	0.967428	mg/L	0.0057046	0.967428	mg/L	0.0057046	0.59%
Ca 315.887 Rt	138467.2	48.8665	mg/L	0.29046	48.8665	mg/L	0.29046	0.59%
Cd 226.502 At	26481.5	1.00144	mg/L	0.003785	1.00144	mg/L	0.003785	0.38%
Ce 418.660 At	-245.7	-0.013420	mg/L	0.0004624	-0.013420	mg/L	0.0004624	3.45%
Co 228.616 At	6180.4	0.999828	mg/L	0.0033545	0.999828	mg/L	0.0033545	0.34%
Cr 267.716 At	20334.9	0.981275	mg/L	0.0012543	0.981275	mg/L	0.0012543	0.13%
Cu 324.752 At	163724.4	1.00033	mg/L	0.003703	1.00033	mg/L	0.003703	0.37%
Fe 273.955 Rt	8089.6	9.77529	mg/L	0.073116	9.77529	mg/L	0.073116	0.75%
Ga 417.206 At	71730.3	0.977961	mg/L	0.0041063	0.977961	mg/L	0.0041063	0.42%
K 766.490 Rt	114453.4	21.7515	mg/L	0.04847	21.7515	mg/L	0.04847	0.22%
La 379.478 At	82224.6	0.979703	mg/L	0.0051755	0.979703	mg/L	0.0051755	0.53%
Li 670.784 Rt	179887.6	0.989013	mg/L	0.0051816	0.989013	mg/L	0.0051816	0.52%
Mg 279.077 Rt	27382.9	23.7015	mg/L	0.00055	23.7015	mg/L	0.00055	0.00%
Mn 260.568 Rt	13882.6	0.996168	mg/L	0.0005176	0.996168	mg/L	0.0005176	0.05%
Mo 202.031 At	4794.9	1.05319	mg/L	0.000660	1.05319	mg/L	0.000660	0.06%
Na 589.592 Rt	329392.7	27.4502	mg/L	0.16892	27.4502	mg/L	0.16892	0.62%
Ni 232.003 At	6525.0	0.981524	mg/L	0.0019533	0.981524	mg/L	0.0019533	0.20%
P 213.617 At	1134.2	0.995048	mg/L	0.0004596	0.995048	mg/L	0.0004596	0.05%
Pb 220.353 At	2599.0	1.02580	mg/L	0.000412	1.02580	mg/L	0.000412	0.04%
Sb 206.836 At	685.7	1.04691	mg/L	0.002421	1.04691	mg/L	0.002421	0.23%
Sc 361.383 At	412615.6	0.482374	mg/L	0.0009137	0.482374	mg/L	0.0009137	0.19%
Se 196.026 At	290.5	1.03497	mg/L	0.005212	1.03497	mg/L	0.005212	0.50%
Si 251.611 Rt	20517.6	13.3423	mg/L	0.03391	13.3423	mg/L	0.03391	0.25%
SIO2 251.611 Rt	20517.6	28.5534	mg/L	0.07257	28.5534	mg/L	0.07257	0.25%
Sn 189.927 At	964.4	1.06084	mg/L	0.001693	1.06084	mg/L	0.001693	0.16%
Sr 421.552 Rt	626828.1	1.16833	mg/L	0.002230	1.16833	mg/L	0.002230	0.19%
Ti 336.121 At	189781.8	0.990066	mg/L	0.0002598	0.990066	mg/L	0.0002598	0.03%
Tl 190.801 At	576.7	1.04814	mg/L	0.006708	1.04814	mg/L	0.006708	0.64%
U 385.958 At	280.3	1.56844	mg/L	0.076953	1.56844	mg/L	0.076953	4.91%
V 292.402 At	77532.4	0.988260	mg/L	0.0004105	0.988260	mg/L	0.0004105	0.04%
Zn 206.200 At	6999.4	1.03156	mg/L	0.001120	1.03156	mg/L	0.001120	0.11%

Sequence No.: 6
Sample ID: CCV
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 10
Date Collected: 4/27/2009 4:26:55 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCV

Analyte	Mean Corrected Intensity	Calib Conc.	Calib Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	235646.8	101.669	%	0.3700				0.36%
Lu 261.542 A	1586929.9	101.507	%	0.2440				0.24%
Ag 328.068 At	194332.3	2.05005	mg/L	0.000385	2.05005	mg/L	0.000385	0.02%
QC value within limits for Ag 328.068 A Recovery = 102.50%								
Al 308.215 Rt	2277.3	1.97296	mg/L	0.019422	1.97296	mg/L	0.019422	0.98%
QC value within limits for Al 308.215 R Recovery = 98.65%								
As 188.979 At	729.8	2.11242	mg/L	0.017638	2.11242	mg/L	0.017638	0.83%
QC value within limits for As 188.979 A Recovery = 105.62%								
B 249.677 Rt	10755.2	1.98759	mg/L	0.017414	1.98759	mg/L	0.017414	0.88%
QC value within limits for B 249.677 R Recovery = 99.38%								
Ba 233.527 At	54634.5	2.02817	mg/L	0.002979	2.02817	mg/L	0.002979	0.15%
QC value within limits for Ba 233.527 A Recovery = 101.41%								
Be 313.107 Rt	297286.8	1.97592	mg/L	0.003040	1.97592	mg/L	0.003040	0.15%
QC value within limits for Be 313.107 R Recovery = 98.80%								
Bi 222.821 At	5397.9	3.80504	mg/L	0.019977	3.80504	mg/L	0.019977	0.53%
QC value within limits for Bi 222.821 A Recovery = 95.13%								
Ca 315.887 Rt	5701.2	2.00239	mg/L	0.013741	2.00239	mg/L	0.013741	0.69%
QC value within limits for Ca 315.887 R Recovery = 100.12%								
Cd 226.502 At	53412.9	2.02484	mg/L	0.014055	2.02484	mg/L	0.014055	0.69%
QC value within limits for Cd 226.502 A Recovery = 101.24%								
Ce 418.660 At	-601.6	-0.028266	mg/L	0.0000607	-0.028266	mg/L	0.0000607	0.21%
QC value within limits for Ce 418.660 A Recovery = Not calculated								
Co 228.616 At	12390.7	2.00475	mg/L	0.000276	2.00475	mg/L	0.000276	0.01%
QC value within limits for Co 228.616 A Recovery = 100.24%								
Cr 267.716 At	41411.2	1.99835	mg/L	0.011443	1.99835	mg/L	0.011443	0.57%
QC value within limits for Cr 267.716 A Recovery = 99.92%								
Cu 324.752 At	316654.5	1.93515	mg/L	0.013387	1.93515	mg/L	0.013387	0.69%
QC value within limits for Cu 324.752 A Recovery = 96.76%								
Fe 273.955 Rt	1702.1	2.05523	mg/L	0.018467	2.05523	mg/L	0.018467	0.90%
QC value within limits for Fe 273.955 R Recovery = 102.76%								
Ga 417.206 At	273822.2	3.74465	mg/L	0.052046	3.74465	mg/L	0.052046	1.39%
QC value within limits for Ga 417.206 A Recovery = 93.62%								
K 766.490 Rt	99912.1	18.9885	mg/L	0.12529	18.9885	mg/L	0.12529	0.66%
QC value within limits for K 766.490 R Recovery = 94.94%								
La 379.478 At	331466.5	3.95878	mg/L	0.000542	3.95878	mg/L	0.000542	0.01%
QC value within limits for La 379.478 A Recovery = 98.97%								
Li 670.784 Rt	675789.9	3.71554	mg/L	0.019631	3.71554	mg/L	0.019631	0.53%
QC value within limits for Li 670.784 R Recovery = 92.89%								
Mg 279.077 Rt	2306.7	2.00629	mg/L	0.010110	2.00629	mg/L	0.010110	0.50%
QC value within limits for Mg 279.077 R Recovery = 100.31%								
Mn 260.568 Rt	27605.5	1.98313	mg/L	0.004370	1.98313	mg/L	0.004370	0.22%
QC value within limits for Mn 260.568 R Recovery = 99.16%								
Mo 202.031 At	9601.0	2.11021	mg/L	0.005105	2.11021	mg/L	0.005105	0.24%
QC value within limits for Mo 202.031 A Recovery = 105.51%								
Na 589.592 Rt	239886.3	19.9911	mg/L	0.07260	19.9911	mg/L	0.07260	0.36%
QC value within limits for Na 589.592 R Recovery = 99.96%								
Ni 232.003 At	13390.1	2.01064	mg/L	0.005472	2.01064	mg/L	0.005472	0.27%
QC value within limits for Ni 232.003 A Recovery = 100.53%								
P 213.617 At	11289.1	10.1424	mg/L	0.00281	10.1424	mg/L	0.00281	0.03%
QC value within limits for P 213.617 A Recovery = 101.42%								
Pb 220.353 At	5171.4	2.04075	mg/L	0.011391	2.04075	mg/L	0.011391	0.56%
QC value within limits for Pb 220.353 A Recovery = 102.04%								
Sb 206.836 At	1382.6	2.11417	mg/L	0.006344	2.11417	mg/L	0.006344	0.30%
QC value within limits for Sb 206.836 A Recovery = 105.71%								
Sc 361.383 At	827610.1	0.967411	mg/L	0.0003543	0.967411	mg/L	0.0003543	0.04%
QC value within limits for Sc 361.383 A Recovery = 96.74%								
Se 196.026 At	603.9	2.14492	mg/L	0.004505	2.14492	mg/L	0.004505	0.21%
QC value within limits for Se 196.026 A Recovery = 107.25%								
Si 251.611 Rt	15694.1	10.1673	mg/L	0.06637	10.1673	mg/L	0.06637	0.65%
QC value within limits for Si 251.611 R Recovery = 101.67%								

SIO2 251.611 R†	15694.1	21.7596	mg/L	0.14203	21.7596	mg/L	0.14203	0.65%
QC value within limits for SIO2 251.611 R Recovery = 101.68%								
Sn 189.927 A†	3745.2	4.11129	mg/L	0.014053	4.11129	mg/L	0.014053	0.34%
QC value within limits for Sn 189.927 A Recovery = 102.78%								
Sr 421.552 R†	1012391.3	1.88753	mg/L	0.001730	1.88753	mg/L	0.001730	0.09%
QC value within limits for Sr 421.552 R Recovery = 94.38%								
Ti 336.121 A†	378181.3	1.97313	mg/L	0.004883	1.97313	mg/L	0.004883	0.25%
QC value within limits for Ti 336.121 A Recovery = 98.66%								
Tl 190.801 A†	1152.3	2.09628	mg/L	0.004281	2.09628	mg/L	0.004281	0.20%
QC value within limits for Tl 190.801 A Recovery = 104.81%								
U 385.958 A†	341.5	1.86353	mg/L	0.069830	1.86353	mg/L	0.069830	3.75%
V 292.402 A†	155802.7	1.98510	mg/L	0.001799	1.98510	mg/L	0.001799	0.09%
QC value within limits for V 292.402 A Recovery = 99.25%								
Zn 206.200 A†	14433.9	2.12776	mg/L	0.015475	2.12776	mg/L	0.015475	0.73%
QC value within limits for Zn 206.200 A Recovery = 106.39%								

All analyte(s) passed QC.

73

Sequence No.: 7
Sample ID: CCB
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 1
Date Collected: 4/27/2009 4:32:31 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: CCB

Analyte	Mean Corrected Intensity	Conc.	Calib Units	Std.Dev.	Conc.	Sample Units	Std.Dev.	RSD
Lu 261.542 R	236688.0	102.118	%	0.8306				0.81%
Lu 261.542 A	1606857.1	102.782	%	0.4436				0.43%
Ag 328.068 At	5.2	0.000085	mg/L	0.0001998	0.000085	mg/L	0.0001998	234.52%
QC value within limits for Ag 328.068 A Recovery = Not calculated								
Al 308.215 Rt	-0.0	-0.000135	mg/L	0.0026597	-0.000135	mg/L	0.0026597	>999.9%
QC value within limits for Al 308.215 R Recovery = Not calculated								
As 188.979 At	-1.7	-0.005205	mg/L	0.0009986	-0.005205	mg/L	0.0009986	19.19%
QC value within limits for As 188.979 A Recovery = Not calculated								
B 249.677 Rt	10.1	0.001862	mg/L	0.0005665	0.001862	mg/L	0.0005665	30.43%
QC value within limits for B 249.677 R Recovery = Not calculated								
Ba 233.527 At	5.8	0.000213	mg/L	0.0000564	0.000213	mg/L	0.0000564	26.51%
QC value within limits for Ba 233.527 A Recovery = Not calculated								
Be 313.107 Rt	3.0	0.000015	mg/L	0.0000129	0.000015	mg/L	0.0000129	87.75%
QC value within limits for Be 313.107 R Recovery = Not calculated								
Bi 222.821 At	9.0	0.006412	mg/L	0.0038339	0.006412	mg/L	0.0038339	59.80%
QC value within limits for Bi 222.821 A Recovery = Not calculated								
Ca 315.887 Rt	2.5	0.001085	mg/L	0.0002413	0.001085	mg/L	0.0002413	22.24%
QC value within limits for Ca 315.887 R Recovery = Not calculated								
Cd 226.502 At	-2.6	-0.000101	mg/L	0.0001849	-0.000101	mg/L	0.0001849	183.14%
QC value within limits for Cd 226.502 A Recovery = Not calculated								
Ce 418.660 At	-3.4	0.000020	mg/L	0.0001045	0.000020	mg/L	0.0001045	515.47%
Co 228.616 At	-0.1	-0.000008	mg/L	0.0002160	-0.000008	mg/L	0.0002160	>999.9%
QC value within limits for Co 228.616 A Recovery = Not calculated								
Cr 267.716 At	3.6	0.000158	mg/L	0.0000384	0.000158	mg/L	0.0000384	24.26%
QC value within limits for Cr 267.716 A Recovery = Not calculated								
Cu 324.752 At	-34.2	-0.000198	mg/L	0.0001137	-0.000198	mg/L	0.0001137	57.41%
QC value within limits for Cu 324.752 A Recovery = Not calculated								
Fe 273.955 Rt	-0.2	-0.000406	mg/L	0.0003297	-0.000406	mg/L	0.0003297	81.15%
QC value within limits for Fe 273.955 R Recovery = Not calculated								
Ga 417.206 At	-6.6	0.000000	mg/L	0.0000535	0.000000	mg/L	0.0000535	>999.9%
QC value within limits for Ga 417.206 A Recovery = Not calculated								
K 766.490 Rt	35.7	0.006793	mg/L	0.0039331	0.006793	mg/L	0.0039331	57.90%
QC value within limits for K 766.490 R Recovery = Not calculated								
La 379.478 At	15.0	0.000179	mg/L	0.0000394	0.000179	mg/L	0.0000394	22.01%
QC value within limits for La 379.478 A Recovery = Not calculated								
Li 670.784 Rt	279.3	0.001536	mg/L	0.0002124	0.001536	mg/L	0.0002124	13.83%
QC value within limits for Li 670.784 R Recovery = Not calculated								
Mg 279.077 Rt	-0.5	-0.000604	mg/L	0.0011564	-0.000604	mg/L	0.0011564	191.35%
QC value within limits for Mg 279.077 R Recovery = Not calculated								
Mn 260.568 Rt	-1.8	-0.000137	mg/L	0.0000185	-0.000137	mg/L	0.0000185	13.55%
QC value within limits for Mn 260.568 R Recovery = Not calculated								
Mo 202.031 At	-0.8	-0.000248	mg/L	0.0002965	-0.000248	mg/L	0.0002965	119.34%
QC value within limits for Mo 202.031 A Recovery = Not calculated								
Na 589.592 Rt	49.1	0.004091	mg/L	0.0006437	0.004091	mg/L	0.0006437	15.74%
QC value within limits for Na 589.592 R Recovery = Not calculated								
Ni 232.003 At	1.8	0.000293	mg/L	0.0003642	0.000293	mg/L	0.0003642	124.13%
QC value within limits for Ni 232.003 A Recovery = Not calculated								
P 213.617 At	2.5	0.002257	mg/L	0.0011955	0.002257	mg/L	0.0011955	52.97%
QC value within limits for P 213.617 A Recovery = Not calculated								
Pb 220.353 At	-0.2	-0.000040	mg/L	0.0017661	-0.000040	mg/L	0.0017661	>999.9%
QC value within limits for Pb 220.353 A Recovery = Not calculated								
Sb 206.836 At	1.9	0.002906	mg/L	0.0007644	0.002906	mg/L	0.0007644	26.31%
QC value within limits for Sb 206.836 A Recovery = Not calculated								
Sc 361.383 At	14.2	0.000017	mg/L	0.0000057	0.000017	mg/L	0.0000057	33.16%
QC value within limits for Sc 361.383 A Recovery = Not calculated								
Se 196.026 At	-0.4	-0.001588	mg/L	0.0018370	-0.001588	mg/L	0.0018370	115.65%
QC value within limits for Se 196.026 A Recovery = Not calculated								
Si 251.611 Rt	10.4	0.006777	mg/L	0.0005472	0.006777	mg/L	0.0005472	8.07%
QC value within limits for Si 251.611 R Recovery = Not calculated								
SIO2 251.611 Rt	10.4	0.014502	mg/L	0.0011710	0.014502	mg/L	0.0011710	8.07%

94

QC value within limits for SIO2 251.611 R Recovery = Not calculated							
Sn 189.927 A†	-0.9	-0.001026	mg/L	0.0008281	-0.001026	mg/L	0.0008281 80.68%
QC value within limits for Sn 189.927 A Recovery = Not calculated							
Sr 421.552 R†	18.3	0.000034	mg/L	0.0000236	0.000034	mg/L	0.0000236 69.14%
QC value within limits for Sr 421.552 R Recovery = Not calculated							
Ti 336.121 A†	48.8	0.000286	mg/L	0.0000744	0.000286	mg/L	0.0000744 26.05%
QC value within limits for Ti 336.121 A Recovery = Not calculated							
Tl 190.801 A†	1.5	0.002783	mg/L	0.0007563	0.002783	mg/L	0.0007563 27.18%
QC value within limits for Tl 190.801 A Recovery = Not calculated							
U 385.958 A†	-8.6	-0.055800	mg/L	0.0919394	-0.055800	mg/L	0.0919394 164.76%
V 292.402 A†	-5.1	-0.000126	mg/L	0.0000233	-0.000126	mg/L	0.0000233 18.44%
QC value within limits for V 292.402 A Recovery = Not calculated							
Zn 206.200 A†	-4.9	-0.000728	mg/L	0.0000239	-0.000728	mg/L	0.0000239 3.29%
QC value within limits for Zn 206.200 A Recovery = Not calculated							

All analyte(s) passed QC.

W916206

SVL ANALYTICAL

Log/Preparation Bench Sheet

See Extraction Comments

W916206

MS 4078 -75

Matrix: Water

Prepared using: SOP 4078 (3020A ICPMS)

Earliest Due: 04/29/09 Earliest Expiration: 09/30/09 17:00

			Origin	Hold Time Expires	Home Location	Client	Due Date
W916206-BLK1	Blank	[50mL - 50mL]					
W916206-BS1	LCS	[50mL - 50mL]	Spike 1: 09D0031				
W916206-MS1	Matrix Spike [W9D0298-01]	[50mL - 50mL]	Spike 1: 09D0031				
W916206-MSD1	MS Dup [W9D0298-01]	[50mL - 50mL]	Spike 1: 09D0031				
W9D0298-01	**A** by TR 6020 As						29-Apr-09
ClientSample ID:	SIEVE DRB	[50mL - 50mL]	Arizona	30-Sep-09 17:00	WarmRoom 33 E	Golder Associates (AZ)	

04/29/2009

Preparation Reagents

Standard	Description	Lot Number
09A0206	HNO3, conc.	K1408

Standard	Description	Lot Number

Spike Standards

Standard	Description	Amount (µL)
09D0031	F-26+U	500

Standard	Description	Amount (µL)

Digested By: DT Date/Time: 4/16/09 1700/2300 Instrument ID: PE ICPMS DRC-E

Analyzed By: KWH Date/Time: 4/28/09

Reviewed By: KH Date: 04/28/2009 Data File(s): 118E

Instrument operating conditions and parameters for this analytical batch are as stated in

SVL ANALYTICAL, INC. KELLOGG, IDAHO

ICP-MS STANDARDS

DATA SET: 118E

STANDARD	SOURCE/LOT #	PREP DATE	PREP BY
S0/ICB/CCB	N/A	4/28/2009	KWH
Standards Stock	09C0299	3/30/2009	KWH
S1	Standards Stock	4/28/2009	KWH
S2/RCLS	Standards Stock	4/28/2009	KWH
S3	Standards Stock	4/28/2009	KWH
S4	Standards Stock	4/28/2009	KWH
S5	Standards Stock	4/28/2009	KWH
S6	Standards Stock	4/28/2009	KWH
CCV	Standards Stock	4/28/2009	KWH
ICV Stock	09C0298	3/20/2009	KWH
ICV	ICV Stock	4/28/2009	KWH
ICSA	08K0009	4/1/2009	KWH
ICSAB	08K0010	4/1/2009	KWH
Internal Standard	09D0011	4/1/2009	KWH

Analytical Standard Summary

09C0299

Description: MS-10PPM CAL STOCK
Standard Type: Calibration Standard
Solvent: 2%HNO3
Final Volume 200
Vials: 1

Department: ICPMS
Prepared By: Kevin Hathaway
Lot : -
Prepared: 30-Mar-09
Expires: 29-Aug-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	10	ug/mL
Antimony	7440-36-0	10	ug/mL
Arsenic	7440-38-2	10	ug/mL
Barium	7440-39-3	10	ug/mL
Beryllium	7440-41-7	10	ug/mL
Boron	7440-42-8	10	ug/mL
Cadmium	7440-43-9	10	ug/mL
Calcium	7440-70-2	10	ug/mL
Chromium	7440-47-3	10	ug/mL
Cobalt	7440-48-4	10	ug/mL
Copper	7440-50-8	10	ug/mL
Iron	7439-89-6	10	ug/mL
Lead	7439-92-1	10	ug/mL
Magnesium	7439-95-4	10	ug/mL
Manganese	7439-96-5	10	ug/mL
Molybdenum	7439-98-7	10	ug/mL
Nickel	7440-02-0	10	ug/mL
[illegible]assium	7440-09-7	100	ug/mL
[illegible]nium	7782-49-2	10	ug/mL
Silica (SiO2)	7631-86-9	10.7	ug/mL
Silicon	7440-21-3	5	ug/mL
Silver	7440-22-4	10	ug/mL
Sodium	7440-23-5	10	ug/mL
Thallium	7440-28-0	10	ug/mL
Titanium	7440-32-6	10	ug/mL
Uranium	7440-61-1	10	ug/mL
Vanadium	7440-62-2	10	ug/mL
Zinc	7440-66-6	10	ug/mL

Analytical Standard Summary

09C0299

78

ent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08C0081	Uranium	Uranium	10-Mar-08	Vendor	29-Aug-09	1000 ug/mL	2
08J0535	QCS-26 (0816542)	Magnesium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Aluminum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Antimony	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Arsenic	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Barium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Beryllium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Boron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Cadmium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Calcium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Chromium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Cobalt	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Copper	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Lead	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Zinc	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Manganese	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Molybdenum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Nickel	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Potassium	30-Oct-08	Vendor	16-Oct-09	1000 ug/mL	20
08J0535	QCS-26 (0816542)	Selenium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Silica (SiO2)	30-Oct-08	Vendor	16-Oct-09	107 ug/mL	20
08J0535	QCS-26 (0816542)	Silicon	30-Oct-08	Vendor	16-Oct-09	50 ug/mL	20
08J0535	QCS-26 (0816542)	Silver	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Sodium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Thallium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Titanium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Vanadium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0535	QCS-26 (0816542)	Iron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20

Rev 14 3/30/2005 09/16/2009

Analytical Standard Summary

09C0298

79

Description: MS-10PPM ICV STOCK
Standard Type: Other
Solvent: 2%HNO3
Final Volume 200
Vials: 1

Department: ICPMS
Prepared By: Kevin Hathaway
Lot : -
Prepared: 30-Mar-09
Expires: 16-Oct-09

Comments:

Analyte	CAS Number	Concentration	Units
Aluminum	7429-90-5	10	mg/L
Antimony	7440-36-0	10	mg/L
Arsenic	7440-38-2	10	mg/L
Barium	7440-39-3	10	mg/L
Beryllium	7440-41-7	10	mg/L
Boron	7440-42-8	10	mg/L
Cadmium	7440-43-9	10	mg/L
Calcium	7440-70-2	10	mg/L
Chromium	7440-47-3	10	mg/L
Cobalt	7440-48-4	10	mg/L
Copper	7440-50-8	10	mg/L
Iron	7439-89-6	10	mg/L
Lead	7439-92-1	10	mg/L
Magnesium	7439-95-4	10	mg/L
Manganese	7439-96-5	10	mg/L
Molybdenum	7439-98-7	10	mg/L
Nickel	7440-02-0	10	mg/L
[illegible]assium	7440-09-7	100	mg/L
[illegible]nium	7782-49-2	10	mg/L
Silica (SiO2)	7631-86-9	10.7	mg/L
Silicon	7440-21-3	5	mg/L
Silver	7440-22-4	10	mg/L
Sodium	7440-23-5	10	mg/L
Thallium	7440-28-0	10	mg/L
Titanium	7440-32-6	10	mg/L
Uranium	7440-61-1	10	mg/L
Vanadium	7440-62-2	10	mg/L
Zinc	7440-66-6	10	mg/L

Analytical Standard Summary

09C0298

80

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08J0536	QCS-26 (0816541)	Magnesium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Aluminum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Antimony	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Arsenic	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Barium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Beryllium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Boron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Cadmium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Calcium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Chromium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Cobalt	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Copper	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Lead	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Zinc	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Manganese	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Molybdenum	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Nickel	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Potassium	30-Oct-08	Vendor	16-Oct-09	1000 ug/mL	20
08J0536	QCS-26 (0816541)	Selenium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Silica (SiO2)	30-Oct-08	Vendor	16-Oct-09	107 ug/mL	20
08J0536	QCS-26 (0816541)	Silicon	30-Oct-08	Vendor	16-Oct-09	50 ug/mL	20
08J0536	QCS-26 (0816541)	Silver	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Sodium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Thallium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Titanium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Vanadium	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08J0536	QCS-26 (0816541)	Iron	30-Oct-08	Vendor	16-Oct-09	100 ug/mL	20
08E0137	Uranium	Uranium	19-May-08	Kevin Hathaway	13-Nov-09	1000 ug/mL	2

3/30/2009

04/16/2009

Analytical Standard Summary

08K0009

81

Description: ICP-MS-ICSA
Standard Type: Reference Material
Solvent: 2% HNO3
Final Volume 250
Vials: 1

Department: ICPMS
Prepared By: Kevin Hathaway
Lot : 0805303
Prepared: 03-Nov-08
Expires: 20-Oct-09

Comments:

Analyte	CAS Number	Concentration	Units	Control Limits
Aluminum	7429-90-5	500	mg/L	80-120
Calcium	7440-70-2	500	mg/L	80-120
Carbon	7440-44-0	1000	mg/L	80-120
Chloride	16887-00-6	3600	mg/L	80-120
Iron	7439-89-6	500	mg/L	80-120
Magnesium	7439-95-4	500	mg/L	80-120
Molybdenum	7439-98-7	10	mg/L	80-120
Phosphorus	7723-14-0	500	mg/L	80-120
Potassium	7440-09-7	500	mg/L	80-120
Sodium	7440-23-5	500	mg/L	80-120
Sulfur	7704-34-9	500	mg/L	80-120
Titanium	7440-32-6	10	mg/L	80-120

Prepared By — 11/3/08 Date

Reviewed By — DG 11/14/08 Date

Analytical Standard Summary

08K0010

82

Description: ICP-MS-ICSAB
Standard Type: Reference Material
Solvent: 2% HNO3
Final Volume 1
Vials: 1

Department: ICPMS
Prepared By: Kevin Hathaway
Lot : 0802405
Prepared: 03-Nov-08
Expires: 20-Oct-09

Comments:

Analyte	CAS Number	Concentration	Units	Control Limits
Aluminum	7429-90-5	500	mg/L	80-120
Arsenic	7440-38-2	0.1	mg/L	80-120
Cadmium	7440-43-9	0.05	mg/L	80-120
Calcium	7440-70-2	500	mg/L	80-120
Carbon	7440-44-0	1000	mg/L	80-120
Chloride	16887-00-6	3600	mg/L	80-120
Chromium	7440-47-3	0.1	mg/L	80-120
Cobalt	7440-48-4	0.2	mg/L	80-120
Copper	7440-50-8	0.1	mg/L	80-120
Iron	7439-89-6	500	mg/L	80-120
Magnesium	7439-95-4	500	mg/L	80-120
Manganese	7439-96-5	0.1	mg/L	80-120
Molybdenum	7439-98-7	10	mg/L	80-120
Nickel	7440-02-0	0.2	mg/L	80-120
Phosphorus	7723-14-0	500	mg/L	80-120
Potassium	7440-09-7	500	mg/L	80-120
Selenium	7782-49-2	0.1	mg/L	80-120
Silver	7440-22-4	0.1	mg/L	80-120
Sodium	7440-23-5	500	mg/L	80-120
Sulfur	7704-34-9	500	mg/L	80-120
Titanium	7440-32-6	10	mg/L	80-120
Vanadium	7440-62-2	0.2	mg/L	80-120
Zinc	7440-66-6	0.1	mg/L	80-120

LAW 11/3/08
Prepared By Date

DG 11/14/08
Reviewed By Date

Analytical Standard Summary

09D0011

83

Description: MS-INTERNAL STANDARD SOL
Standard Type: Internal Standard
Solvent: 2%HNO3
Final Volume 1000
Vials: 1

Department: ICPMS
Prepared By: Kevin Hathaway
Lot : 08K0215
Prepared: 01-Apr-09
Expires: 18-May-09

Comments:

Analyte	CAS Number	Concentration	Units
Bismuth	7440-69-9	0.1	ug/mL
Gallium	7440-55-3	0.27	ug/mL
Holmium	7440-60-0	0.1	ug/mL
Indium	7440-74-6	0.1	ug/mL
Lithium	7439-93-2	0.1	ug/mL
Rhodium	7440-16-6	0.1	ug/mL
Scandium	7440-20-2	0.1	ug/mL
Terbium	7440-27-9	0.1	ug/mL
Yttrium	7440-65-5	0.1	ug/mL

Parent Standards used in this standard:

Standard	Standard Description	Analyte	Prepared	Prepared By	Expires	Concentration	mL used
08D0021	MS-INTERNAL STD-MIX-1	Yttrium	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08D0021	MS-INTERNAL STD-MIX-1	Terbium	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08D0021	MS-INTERNAL STD-MIX-1	Scandium	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08D0021	MS-INTERNAL STD-MIX-1	Lithium	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08D0021	MS-INTERNAL STD-MIX-1	Indium	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08D0021	MS-INTERNAL STD-MIX-1	Holmium	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08D0021	MS-INTERNAL STD-MIX-1	Bismuth	03-Apr-08	Vendor	30-Sep-09	10 ug/mL	10
08K0215	MS-INTERNAL STD-MIX-2	Rhodium	18-Nov-08	Kevin Hathaway	18-May-09	10 ug/mL	10
08K0215	MS-INTERNAL STD-MIX-2	Gallium	18-Nov-08	Kevin Hathaway	18-May-09	27 ug/mL	10

Kevin 4/1/09 04/16/2009

Quantitative Analysis Calibration Report

File Name: 118E.cal
File Path: C:\Elandata\System
Calibration Type: External Calibration

Analyte	Mass	Curve Type	Slope	Intercept	Corr. Coeff.
Ga	70.925	Linear Thru Zero	0.00	0.00	0.000000
As	74.922	Linear Thru Zero	0.00	0.00	0.999877
Cl	34.969	Linear Thru Zero	0.00	0.00	0.000000
Kr	82.914	Linear Thru Zero	0.00	0.00	0.000000
Ru	98.906	Linear Thru Zero	0.00	0.00	0.000000
Pd	104.905	Linear Thru Zero	0.00	0.00	0.000000
Sn	117.902	Linear Thru Zero	0.00	0.00	0.000000

Quantitative Analysis - Summary Report
Sample ID: Cal Blank
Sample Date/Time: Tuesday, April 28, 2009 10:49:46
Solution Type: Blank
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\Cal Blank.001
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	481999.43				ug/L
	As	75	-1948.78				ug/L
	Cl	35	44664734.51				ug/L
	Kr	83	35.00				ug/L
	Ru	99	0.00				ug/L
	Pd	105	2206.84				ug/L
	Sn	118	156.67				ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	473321.38				ug/L
As	75	-2042.85				ug/L
Cl	35	46226094.88				ug/L
Kr	83	36.33				ug/L
Ru	99	0.00				ug/L
Pd	105	2030.14				ug/L
Sn	118	140.00				ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	481971.50				ug/L
As	75	-1807.03				ug/L
Cl	35	44087105.35				ug/L
Kr	83	36.33				ug/L
Ru	99	0.00				ug/L
Pd	105	2200.17				ug/L
Sn	118	130.00				ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	490705.41				ug/L
As	75	-1996.47				ug/L
Cl	35	43681003.31				ug/L
Kr	83	32.33				ug/L
Ru	99	0.00				ug/L
Pd	105	2390.20				ug/L
Sn	118	200.00				ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: Cal Std 1
Sample Date/Time: Tuesday, April 28, 2009 10:51:39
Solution Type: Standard
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\Cal Std 1.002
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	473954.88	473954.876			ug/L
[	As	75	-1725.54	0.000	**0.1000**	66.237	ug/L
	Cl	35	40891137.90	-3773596.610			ug/L
	Kr	83	32.89	-2.111			ug/L
	Ru	99	1.67	1.667			ug/L
	Pd	105	2460.21	253.376			ug/L
	Sn	118	173.33	16.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	476721.68	476721.685	481999.431		ug/L
As	75	-1601.79	0.001	-1948.783	**0.17030**	ug/L
Cl	35	42710252.53	-1954481.979	44664734.514		ug/L
Kr	83	32.00	-3.000	35.000		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2490.22	283.379	2206.838		ug/L
Sn	118	110.00	-46.667	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	475655.00	475654.998	481999.431		ug/L
As	75	-1749.61	0.000	-1948.783	**0.09094**	ug/L
Cl	35	40587952.13	-4076782.381	44664734.514		ug/L
Kr	83	39.33	4.333	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2720.26	513.421	2206.838		ug/L
Sn	118	250.00	93.335	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	469487.94	469487.944	481999.431		ug/L
As	75	-1825.21	0.000	-1948.783	**0.03876**	ug/L
Cl	35	39375209.04	-5289525.469	44664734.514		ug/L
Kr	83	27.33	-7.667	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2170.16	-36.673	2206.838		ug/L
Sn	118	160.00	3.333	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: Cal Std 2
Sample Date/Time: Tuesday, April 28, 2009 10:53:33
Solution Type: Standard
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\Cal Std 2.003
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
⌈>	Ga	71	480206.95	480206.951			ug/L
⌊	As	75	-363.97	0.003	**0.9978**	3.397	ug/L
	Cl	35	40519341.28	-4145393.229			ug/L
	Kr	83	33.67	-1.333			ug/L
	Ru	99	3.33	3.333			ug/L
	Pd	105	2370.20	163.360			ug/L
	Sn	118	136.67	-20.000			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	478894.58	478894.577	481999.431		ug/L
As	75	-411.67	0.003	-1948.783	**0.96694**	ug/L
Cl	35	42126133.16	-2538601.355	44664734.514		ug/L
Kr	83	33.67	-1.333	35.000		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2410.20	203.365	2206.838		ug/L
Sn	118	130.00	-26.667	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	479479.72	479479.722	481999.431		ug/L
As	75	-306.16	0.003	-1948.783	**1.03409**	ug/L
Cl	35	39850849.11	-4813885.405	44664734.514		ug/L
Kr	83	32.67	-2.333	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2560.23	353.392	2206.838		ug/L
Sn	118	120.00	-36.667	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	482246.55	482246.555	481999.431		ug/L
As	75	-374.08	0.003	-1948.783	**0.99242**	ug/L
Cl	35	39581041.59	-5083692.926	44664734.514		ug/L
Kr	83	34.67	-0.333	35.000		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2140.16	-66.678	2206.838		ug/L
Sn	118	160.00	3.333	156.668		ug/L

QC Calculated Values

90

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: Cal Std 3
Sample Date/Time: Tuesday, April 28, 2009 10:55:26
Solution Type: Standard
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\Cal Std 3.004
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	482702.31	482702.306			ug/L
	As	75	11904.93	0.029	**9.9853**	1.053	ug/L
	Cl	35	39419713.38	-5245021.135			ug/L
	Kr	83	32.44	-2.556			ug/L
	Ru	99	3.33	3.333			ug/L
	Pd	105	2590.23	383.397			ug/L
	Sn	118	236.67	80.001			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	480639.74	480639.742	481999.431		ug/L
As	75	11857.43	0.029	-1948.783	**9.98772**	ug/L
Cl	35	40638019.51	-4026715.006	44664734.514		ug/L
Kr	83	35.33	0.333	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2640.24	433.406	2206.838		ug/L
Sn	118	300.00	143.336	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	484050.04	484050.036	481999.431		ug/L
As	75	11790.25	0.028	-1948.783	**9.87899**	ug/L
Cl	35	39063678.71	-5601055.803	44664734.514		ug/L
Kr	83	31.33	-3.667	35.000		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2510.22	303.383	2206.838		ug/L
Sn	118	230.00	73.334	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	483417.14	483417.138	481999.431		ug/L
As	75	12067.11	0.029	-1948.783	**10.08929**	ug/L
Cl	35	38557441.92	-6107292.596	44664734.514		ug/L
Kr	83	30.67	-4.333	35.000		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2620.24	413.402	2206.838		ug/L
Sn	118	180.00	23.334	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
⌈>	Ga	71		
⌊	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: Cal Std 4
Sample Date/Time: Tuesday, April 28, 2009 10:57:19
Solution Type: Standard
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\Cal Std 4.005
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
⌈>	Ga	71	481988.96	481988.964			ug/L
⌊	As	75	25417.78	0.057	**19.9502**	2.434	ug/L
	Cl	35	39017320.03	-5647414.484			ug/L
	Kr	83	33.67	-1.333			ug/L
	Ru	99	15.00	15.000			ug/L
	Pd	105	2386.87	180.029			ug/L
	Sn	118	166.67	10.000			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	483088.29	483088.290	481999.431		ug/L
As	75	25282.01	0.056	-1948.783	**19.80378**	ug/L
Cl	35	39934294.73	-4730439.779	44664734.514		ug/L
Kr	83	35.33	0.333	35.000		ug/L
Ru	99	15.00	15.000	0.000		ug/L
Pd	105	2380.20	173.360	2206.838		ug/L
Sn	118	160.00	3.333	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	473125.03	473125.032	481999.431		ug/L
As	75	25687.88	0.058	-1948.783	**20.49225**	ug/L
Cl	35	38807778.79	-5856955.720	44664734.514		ug/L
Kr	83	31.33	-3.667	35.000		ug/L
Ru	99	20.00	20.000	0.000		ug/L
Pd	105	2200.17	-6.668	2206.838		ug/L
Sn	118	120.00	-36.667	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	489753.57	489753.572	481999.431		ug/L
As	75	25283.45	0.056	-1948.783	**19.55463**	ug/L
Cl	35	38309886.56	-6354847.951	44664734.514		ug/L
Kr	83	34.33	-0.667	35.000		ug/L
Ru	99	10.00	10.000	0.000		ug/L
Pd	105	2580.23	373.395	2206.838		ug/L
Sn	118	220.00	63.334	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: Cal Std 5
Sample Date/Time: Tuesday, April 28, 2009 10:59:12
Solution Type: Standard
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\Cal Std 5.006
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	481124.24	481124.244			ug/L
	As	75	64116.47	0.137	**49.6967**	1.308	ug/L
	Cl	35	40129928.37	-4534806.147			ug/L
	Kr	83	39.56	4.556			ug/L
	Ru	99	51.67	51.667			ug/L
	Pd	105	2413.54	206.700			ug/L
	Sn	118	183.33	26.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	486195.06	486195.064	481999.431		ug/L
As	75	63852.92	0.135	-1948.783	**48.99294**	ug/L
Cl	35	41781224.57	-2883509.940	44664734.514		ug/L
Kr	83	40.67	5.667	35.000		ug/L
Ru	99	45.00	45.000	0.000		ug/L
Pd	105	2480.22	273.377	2206.838		ug/L
Sn	118	230.00	73.334	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	481332.49	481332.490	481999.431		ug/L
As	75	64317.61	0.138	-1948.783	**49.82249**	ug/L
Cl	35	39572697.02	-5092037.489	44664734.514		ug/L
Kr	83	40.33	5.333	35.000		ug/L
Ru	99	45.00	45.000	0.000		ug/L
Pd	105	2240.18	33.338	2206.838		ug/L
Sn	118	80.00	-76.667	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	475845.18	475845.177	481999.431		ug/L
As	75	64178.88	0.139	-1948.783	**50.27465**	ug/L
Cl	35	39035863.50	-5628871.011	44664734.514		ug/L
Kr	83	37.67	2.667	35.000		ug/L
Ru	99	65.00	65.000	0.000		ug/L
Pd	105	2520.22	313.384	2206.838		ug/L
Sn	118	240.00	83.334	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
[>	Ga	71		
[	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: Cal Std 6
Sample Date/Time: Tuesday, April 28, 2009 11:01:05
Solution Type: Standard
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\Cal Std 6.007
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
⌈>	Ga	71	469150.47	469150.469			ug/L
⌊	As	75	98047.98	0.213	**75.7337**	3.751	ug/L
	Cl	35	38474923.47	-6189811.048			ug/L
	Kr	83	34.67	-0.333			ug/L
	Ru	99	43.33	43.333			ug/L
	Pd	105	2546.89	340.056			ug/L
	Sn	118	143.33	-13.333			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	478917.32	478917.321	481999.431		ug/L
As	75	97341.75	0.207	-1948.783	**73.64623**	ug/L
Cl	35	39603293.75	-5061440.760	44664734.514		ug/L
Kr	83	38.33	3.333	35.000		ug/L
Ru	99	20.00	20.000	0.000		ug/L
Pd	105	2440.21	233.371	2206.838		ug/L
Sn	118	100.00	-56.667	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	473151.90	473151.900	481999.431		ug/L
As	75	97422.05	0.210	-1948.783	**74.58641**	ug/L
Cl	35	37859280.19	-6805454.328	44664734.514		ug/L
Kr	83	34.00	-1.000	35.000		ug/L
Ru	99	50.00	50.000	0.000		ug/L
Pd	105	2580.23	373.395	2206.838		ug/L
Sn	118	190.00	33.334	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	455382.19	455382.186	481999.431		ug/L
As	75	99380.13	0.222	-1948.783	**78.96845**	ug/L
Cl	35	37962196.46	-6702538.057	44664734.514		ug/L
Kr	83	31.67	-3.333	35.000		ug/L
Ru	99	60.00	60.000	0.000		ug/L
Pd	105	2620.24	413.402	2206.838		ug/L
Sn	118	140.00	-16.667	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
⌈>	Ga	71		
⌊	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: ICV
Sample Date/Time: Tuesday, April 28, 2009 11:02:59
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\ICV.008
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
⌈>	Ga	71	475235.87	475235.873			ug/L
⌊	As	75	32756.89	0.073	**25.9267**	1.535	ug/L
	Cl	35	39019174.38	-5645560.136			ug/L
	Kr	83	36.00	1.000			ug/L
	Ru	99	23.33	23.333			ug/L
	Pd	105	2416.87	210.034			ug/L
	Sn	118	170.00	13.333			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	480399.87	480399.873	481999.431		ug/L
As	75	32498.68	0.072	-1948.783	**25.47010**	ug/L
Cl	35	40387682.63	-4277051.882	44664734.514		ug/L
Kr	83	37.67	2.667	35.000		ug/L
Ru	99	25.00	25.000	0.000		ug/L
Pd	105	2420.20	213.367	2206.838		ug/L
Sn	118	170.00	13.333	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	471324.97	471324.973	481999.431		ug/L
As	75	32733.26	0.073	-1948.783	**26.10966**	ug/L
Cl	35	38654795.15	-6009939.367	44664734.514		ug/L
Kr	83	36.33	1.333	35.000		ug/L
Ru	99	15.00	15.000	0.000		ug/L
Pd	105	2200.17	-6.668	2206.838		ug/L
Sn	118	210.00	53.334	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	473982.77	473982.773	481999.431		ug/L
As	75	33038.74	0.074	-1948.783	**26.20027**	ug/L
Cl	35	38015045.35	-6649689.161	44664734.514		ug/L
Kr	83	34.00	-1.000	35.000		ug/L
Ru	99	30.00	30.000	0.000		ug/L
Pd	105	2630.24	423.404	2206.838		ug/L
Sn	118	130.00	-26.667	156.668		ug/L

QC Calculated Values

100

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		98.597
	As	75	103.707	
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: ICB
Sample Date/Time: Tuesday, April 28, 2009 11:04:52
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\ICB.009
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	489699.88	489699.875			ug/L
[	As	75	-1533.05	0.001	**0.3243**	31.778	ug/L
	Cl	35	42219777.69	-2444956.820			ug/L
	Kr	83	36.56	1.556			ug/L
	Ru	99	1.67	1.667			ug/L
	Pd	105	2366.86	160.025			ug/L
	Sn	118	163.33	6.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	491769.07	491769.067	481999.431		ug/L
As	75	-1536.85	0.001	-1948.783	**0.32613**	ug/L
Cl	35	43322187.12	-1342547.393	44664734.514		ug/L
Kr	83	39.00	4.000	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2280.18	73.344	2206.838		ug/L
Sn	118	160.00	3.333	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	489757.71	489757.710	481999.431		ug/L
As	75	-1676.32	0.001	-1948.783	**0.22040**	ug/L
Cl	35	41664400.70	-3000333.815	44664734.514		ug/L
Kr	83	35.33	0.333	35.000		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2400.20	193.364	2206.838		ug/L
Sn	118	180.00	23.334	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	487572.85	487572.848	481999.431		ug/L
As	75	-1385.97	0.001	-1948.783	**0.42651**	ug/L
Cl	35	41672745.26	-2991989.253	44664734.514		ug/L
Kr	83	35.33	0.333	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2420.20	213.367	2206.838		ug/L
Sn	118	150.00	-6.667	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		101.598
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: RCLS
Sample Date/Time: Tuesday, April 28, 2009 11:06:46
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\RCLS.010
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	479907.39	479907.390			ug/L
[	As	75	-225.38	0.004	**1.2705**	8.779	ug/L
	Cl	35	39161031.94	-5503702.573			ug/L
	Kr	83	33.56	-1.444			ug/L
	Ru	99	1.67	1.667			ug/L
	Pd	105	2416.87	210.033			ug/L
	Sn	118	153.33	-3.333			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	484904.29	484904.286	481999.431		ug/L
As	75	-387.52	0.003	-1948.783	**1.15248**	ug/L
Cl	35	40187413.13	-4477321.383	44664734.514		ug/L
Kr	83	37.67	2.667	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2530.22	323.386	2206.838		ug/L
Sn	118	130.00	-26.667	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	472302.47	472302.474	481999.431		ug/L
As	75	-82.73	0.004	-1948.783	**1.37417**	ug/L
Cl	35	38718770.13	-5945964.387	44664734.514		ug/L
Kr	83	32.33	-2.667	35.000		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	2350.19	143.355	2206.838		ug/L
Sn	118	110.00	-46.667	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	482515.41	482515.408	481999.431		ug/L
As	75	-205.88	0.004	-1948.783	**1.28481**	ug/L
Cl	35	38576912.56	-6087821.950	44664734.514		ug/L
Kr	83	30.67	-4.333	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2370.20	163.359	2206.838		ug/L
Sn	118	220.00	63.334	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		99.566
	As	75	127.049	
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: ICSA
Sample Date/Time: Tuesday, April 28, 2009 11:08:39
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\ICSA.011
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	380986.15	380986.151			ug/L
	As	75	-434.27	0.003	**1.0313**	4.008	ug/L
	Cl	35	10166458.68	-34498275.835			ug/L
	Kr	83	104.56	69.556			ug/L
	Ru	99	46.67	46.667			ug/L
	Pd	105	2860.29	653.449			ug/L
	Sn	118	150.00	-6.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	382123.19	382123.185	481999.431		ug/L
As	75	-387.73	0.003	-1948.783	**1.07591**	ug/L
Cl	35	11220655.08	-33444079.435	44664734.514		ug/L
Kr	83	105.33	70.334	35.000		ug/L
Ru	99	50.00	50.000	0.000		ug/L
Pd	105	2880.29	673.452	2206.838		ug/L
Sn	118	180.00	23.334	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	378954.43	378954.434	481999.431		ug/L
As	75	-471.59	0.003	-1948.783	**0.99428**	ug/L
Cl	35	9863272.91	-34801461.606	44664734.514		ug/L
Kr	83	102.00	67.000	35.000		ug/L
Ru	99	45.00	45.000	0.000		ug/L
Pd	105	2990.31	783.475	2206.838		ug/L
Sn	118	150.00	-6.667	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	381880.83	381880.833	481999.431		ug/L
As	75	-443.49	0.003	-1948.783	**1.02381**	ug/L
Cl	35	9415448.05	-35249286.462	44664734.514		ug/L
Kr	83	106.33	71.334	35.000		ug/L
Ru	99	45.00	45.000	0.000		ug/L
Pd	105	2710.26	503.419	2206.838		ug/L
Sn	118	120.00	-36.667	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		79.043
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: ICSAB
Sample Date/Time: Tuesday, April 28, 2009 11:10:33
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\ICSAB.012
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	375021.08	375021.075			ug/L
	As	75	9998.70	0.031	**10.9118**	2.534	ug/L
	Cl	35	9785390.32	-34879344.190			ug/L
	Kr	83	109.44	74.445			ug/L
	Ru	99	40.00	40.000			ug/L
	Pd	105	2566.90	360.060			ug/L
	Sn	118	270.00	113.335			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	382114.97	382114.970	481999.431		ug/L
As	75	9857.14	0.030	-1948.783	**10.60102**	ug/L
Cl	35	10647661.78	-34017072.729	44664734.514		ug/L
Kr	83	101.67	66.667	35.000		ug/L
Ru	99	60.00	60.000	0.000		ug/L
Pd	105	2600.24	393.399	2206.838		ug/L
Sn	118	350.00	193.337	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	368202.69	368202.691	481999.431		ug/L
As	75	10047.17	0.031	-1948.783	**11.13065**	ug/L
Cl	35	9484986.07	-35179748.441	44664734.514		ug/L
Kr	83	117.00	82.000	35.000		ug/L
Ru	99	25.00	25.000	0.000		ug/L
Pd	105	2640.24	433.406	2206.838		ug/L
Sn	118	260.00	103.335	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	374745.56	374745.565	481999.431		ug/L
As	75	10091.79	0.031	-1948.783	**11.00370**	ug/L
Cl	35	9223523.11	-35441211.400	44664734.514		ug/L
Kr	83	109.67	74.667	35.000		ug/L
Ru	99	35.00	35.000	0.000		ug/L
Pd	105	2460.21	253.374	2206.838		ug/L
Sn	118	200.00	43.334	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		77.805
	As	75	109.118	
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: CCV
Sample Date/Time: Tuesday, April 28, 2009 11:12:26
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\CCV.013
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	481376.44	481376.442			ug/L
	As	75	63973.33	0.137	**48.6687**	2.554	ug/L
	Cl	35	39889790.40	-4774944.113			ug/L
	Kr	83	36.56	1.556			ug/L
	Ru	99	45.00	45.000			ug/L
	Pd	105	2453.54	246.707			ug/L
	Sn	118	160.00	3.333			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	481921.87	481921.869	481999.431		ug/L
As	75	64166.71	0.137	-1948.783	**48.73964**	ug/L
Cl	35	40999617.22	-3665117.297	44664734.514		ug/L
Kr	83	39.67	4.667	35.000		ug/L
Ru	99	30.00	30.000	0.000		ug/L
Pd	105	2250.18	43.339	2206.838		ug/L
Sn	118	200.00	43.334	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	470485.99	470485.986	481999.431		ug/L
As	75	64147.16	0.140	-1948.783	**49.87465**	ug/L
Cl	35	39925950.17	-4738784.342	44664734.514		ug/L
Kr	83	36.67	1.667	35.000		ug/L
Ru	99	60.00	60.000	0.000		ug/L
Pd	105	2620.24	413.402	2206.838		ug/L
Sn	118	100.00	-56.667	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	491721.47	491721.470	481999.431		ug/L
As	75	63606.11	0.133	-1948.783	**47.39189**	ug/L
Cl	35	38743803.81	-5920930.700	44664734.514		ug/L
Kr	83	33.33	-1.667	35.000		ug/L
Ru	99	45.00	45.000	0.000		ug/L
Pd	105	2490.22	283.379	2206.838		ug/L
Sn	118	180.00	23.334	156.668		ug/L

QC Calculated Values

110

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		99.871
	As	75	97.337	
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: CCB
Sample Date/Time: Tuesday, April 28, 2009 11:14:20
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\CCB.014
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	479117.14	479117.136			ug/L
	As	75	-1699.58	0.000	**0.1762**	83.017	ug/L
	Cl	35	41452077.94	-3212656.573			ug/L
	Kr	83	32.78	-2.222			ug/L
	Ru	99	3.33	3.333			ug/L
	Pd	105	2573.57	366.727			ug/L
	Sn	118	150.00	-6.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	482395.46	482395.458	481999.431		ug/L
As	75	-1530.09	0.001	-1948.783	**0.30953**	ug/L
Cl	35	42696344.93	-1968389.583	44664734.514		ug/L
Kr	83	29.67	-5.333	35.000		ug/L
Ru	99	10.00	10.000	0.000		ug/L
Pd	105	2540.23	333.388	2206.838		ug/L
Sn	118	170.00	13.333	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	473054.76	473054.761	481999.431		ug/L
As	75	-1646.97	0.001	-1948.783	**0.19951**	ug/L
Cl	35	41425189.91	-3239544.608	44664734.514		ug/L
Kr	83	34.00	-1.000	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2570.23	363.393	2206.838		ug/L
Sn	118	110.00	-46.667	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	481901.19	481901.189	481999.431		ug/L
As	75	-1921.67	0.000	-1948.783	**0.01969**	ug/L
Cl	35	40234698.99	-4430035.528	44664734.514		ug/L
Kr	83	34.67	-0.333	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2610.24	403.401	2206.838		ug/L
Sn	118	170.00	13.333	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
⌈>	Ga	71		99.402
⌊	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W916206-BLK1 2.5X
Sample Date/Time: Tuesday, April 28, 2009 11:16:14
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\W916206-BLK1.015
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	483260.61	483260.609			ug/L
[	As	75	-1676.87	0.001	**0.2040**	13.010	ug/L
	Cl	35	41461349.68	-3203384.837			ug/L
	Kr	83	31.22	-3.778			ug/L
	Ru	99	0.00	0.000			ug/L
	Pd	105	2733.59	526.757			ug/L
	Sn	118	193.33	36.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	470740.16	470740.157	481999.431		ug/L
As	75	-1592.83	0.001	-1948.783	**0.23428**	ug/L
Cl	35	42000964.72	-2663769.793	44664734.514		ug/L
Kr	83	34.67	-0.333	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2720.26	513.421	2206.838		ug/L
Sn	118	210.00	53.334	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	490606.09	490606.088	481999.431		ug/L
As	75	-1728.68	0.001	-1948.783	**0.18458**	ug/L
Cl	35	41021869.38	-3642865.130	44664734.514		ug/L
Kr	83	26.33	-8.667	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2740.26	533.425	2206.838		ug/L
Sn	118	230.00	73.334	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	488435.58	488435.581	481999.431		ug/L
As	75	-1709.11	0.001	-1948.783	**0.19326**	ug/L
Cl	35	41361214.93	-3303519.587	44664734.514		ug/L
Kr	83	32.67	-2.333	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2740.26	533.425	2206.838		ug/L
Sn	118	140.00	-16.667	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
[>	Ga	71		100.262
[	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W916206-BS1 2.5X
Sample Date/Time: Tuesday, April 28, 2009 11:18:08
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\W916206-BS1.016
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
[>	Ga	71	493301.19	493301.187			ug/L
[	As	75	10974.62	0.026	**9.3404**	1.253	ug/L
	Cl	35	41315783.42	-3348951.094			ug/L
	Kr	83	34.56	-0.444			ug/L
	Ru	99	6.67	6.667			ug/L
	Pd	105	2773.60	566.765			ug/L
	Sn	118	183.33	26.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	482864.93	482864.925	481999.431		ug/L
As	75	10866.32	0.027	-1948.783	**9.43132**	ug/L
Cl	35	41847981.07	-2816753.440	44664734.514		ug/L
Kr	83	34.00	-1.000	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2720.26	513.421	2206.838		ug/L
Sn	118	180.00	23.334	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	492433.37	492433.372	481999.431		ug/L
As	75	10772.56	0.026	-1948.783	**9.20834**	ug/L
Cl	35	41102533.49	-3562201.025	44664734.514		ug/L
Kr	83	31.00	-4.000	35.000		ug/L
Ru	99	10.00	10.000	0.000		ug/L
Pd	105	2700.26	493.417	2206.838		ug/L
Sn	118	190.00	33.334	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	504605.26	504605.263	481999.431		ug/L
As	75	11284.97	0.026	-1948.783	**9.38163**	ug/L
Cl	35	40996835.70	-3667898.818	44664734.514		ug/L
Kr	83	38.67	3.667	35.000		ug/L
Ru	99	10.00	10.000	0.000		ug/L
Pd	105	2900.29	693.457	2206.838		ug/L
Sn	118	180.00	23.334	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
[>	Ga	71	-	102.345
[	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W9D0298-01 2.5x
Sample Date/Time: Tuesday, April 28, 2009 11:20:01
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\W9D0298-01.017
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	478942.90	478942.896			ug/L
	As	75	-1687.26	0.001	**0.1846**	14.411	ug/L
	Cl	35	41793277.83	-2871456.683			ug/L
	Kr	83	34.56	-0.444			ug/L
	Ru	99	1.67	1.667			ug/L
	Pd	105	3013.65	806.814			ug/L
	Sn	118	183.33	26.667			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	480846.53	480846.529	481999.431		ug/L
As	75	-1659.14	0.001	-1948.783	**0.21056**	ug/L
Cl	35	42754756.87	-1909977.645	44664734.514		ug/L
Kr	83	36.33	1.333	35.000		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	3240.37	1033.530	2206.838		ug/L
Sn	118	200.00	43.334	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	468471.38	468471.376	481999.431		ug/L
As	75	-1686.54	0.000	-1948.783	**0.15740**	ug/L
Cl	35	41589299.64	-3075434.878	44664734.514		ug/L
Kr	83	31.33	-3.667	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2940.30	733.465	2206.838		ug/L
Sn	118	140.00	-16.667	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	487510.78	487510.783	481999.431		ug/L
As	75	-1716.10	0.001	-1948.783	**0.18581**	ug/L
Cl	35	41035776.99	-3628957.526	44664734.514		ug/L
Kr	83	36.00	1.000	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2860.29	653.448	2206.838		ug/L
Sn	118	210.00	53.334	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
⌈>	Ga	71		99.366
⌊	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W916206-L1 1a,5x
Sample Date/Time: Tuesday, April 28, 2009 11:21:55
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\W916206-L1.018
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	484130.48	484130.479			ug/L
	As	75	-2279.35	-0.001	**-0.2383**	88.845	ug/L
	Cl	35	51591648.58	6926914.071			ug/L
	Kr	83	34.56	-0.444			ug/L
	Ru	99	0.00	0.000			ug/L
	Pd	105	2640.24	433.407			ug/L
	Sn	118	133.33	-23.334			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	480410.21	480410.212	481999.431		ug/L
As	75	-2428.67	-0.001	-1948.783	**-0.35964**	ug/L
Cl	35	52592996.09	7928261.574	44664734.514		ug/L
Kr	83	37.00	2.000	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2700.26	493.417	2206.838		ug/L
Sn	118	110.00	-46.667	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	479665.82	479665.815	481999.431		ug/L
As	75	-2427.44	-0.001	-1948.783	**-0.36151**	ug/L
Cl	35	51166075.90	6501341.382	44664734.514		ug/L
Kr	83	35.67	0.667	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2800.27	593.437	2206.838		ug/L
Sn	118	120.00	-36.667	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	492315.41	492315.409	481999.431		ug/L
As	75	-1981.94	0.000	-1948.783	**0.00617**	ug/L
Cl	35	51015873.77	6351139.257	44664734.514		ug/L
Kr	83	31.00	-4.000	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2420.20	213.367	2206.838		ug/L
Sn	118	170.00	13.333	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		100.442
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W916206-MS1 2.5x
Sample Date/Time: Tuesday, April 28, 2009 11:23:48
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\W916206-MS1.019
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	481668.84	481668.839			ug/L
	As	75	10103.86	0.025	**8.8897**	1.491	ug/L
	Cl	35	42548924.33	-2115810.187			ug/L
	Kr	83	31.89	-3.111			ug/L
	Ru	99	11.67	11.667			ug/L
	Pd	105	3020.32	813.482			ug/L
	Sn	118	210.00	53.334			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	486681.20	486681.204	481999.431		ug/L
As	75	10007.55	0.025	-1948.783	**8.74175**	ug/L
Cl	35	44590560.62	-74173.889	44664734.514		ug/L
Kr	83	32.33	-2.667	35.000		ug/L
Ru	99	10.00	10.000	0.000		ug/L
Pd	105	2820.28	613.440	2206.838		ug/L
Sn	118	220.00	63.334	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	476103.58	476103.576	481999.431		ug/L
As	75	10132.69	0.025	-1948.783	**8.99743**	ug/L
Cl	35	41619896.36	-3044838.149	44664734.514		ug/L
Kr	83	28.67	-6.333	35.000		ug/L
Ru	99	10.00	10.000	0.000		ug/L
Pd	105	3080.33	873.494	2206.838		ug/L
Sn	118	140.00	-16.667	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	482221.74	482221.738	481999.431		ug/L
As	75	10171.33	0.025	-1948.783	**8.92997**	ug/L
Cl	35	41436315.99	-3228418.524	44664734.514		ug/L
Kr	83	34.67	-0.333	35.000		ug/L
Ru	99	15.00	15.000	0.000		ug/L
Pd	105	3160.35	953.512	2206.838		ug/L
Sn	118	270.00	113.335	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71		99.931
	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: W916206-MSD1 2.5x
Sample Date/Time: Tuesday, April 28, 2009 11:25:41
Solution Type: Sample
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\W916206-MSD1.020
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	479141.99	479141.990			ug/L
	As	75	10189.32	0.025	**8.9937**	2.541	ug/L
	Cl	35	40908754.20	-3755980.311			ug/L
	Kr	83	35.11	0.111			ug/L
	Ru	99	10.00	10.000			ug/L
	Pd	105	3213.70	1006.858			ug/L
	Sn	118	180.00	23.334			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	483125.52	483125.517	481999.431		ug/L
As	75	10269.79	0.025	-1948.783	**8.98835**	ug/L
Cl	35	42281898.33	-2382836.188	44664734.514		ug/L
Kr	83	37.00	2.000	35.000		ug/L
Ru	99	10.00	10.000	0.000		ug/L
Pd	105	3100.34	893.499	2206.838		ug/L
Sn	118	140.00	-16.667	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	484050.04	484050.036	481999.431		ug/L
As	75	9989.05	0.025	-1948.783	**8.76787**	ug/L
Cl	35	40301455.49	-4363279.028	44664734.514		ug/L
Kr	83	30.67	-4.333	35.000		ug/L
Ru	99	5.00	5.000	0.000		ug/L
Pd	105	3400.40	1193.567	2206.838		ug/L
Sn	118	200.00	43.334	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	470250.42	470250.417	481999.431		ug/L
As	75	10309.11	0.026	-1948.783	**9.22482**	ug/L
Cl	35	40142908.80	-4521825.716	44664734.514		ug/L
Kr	83	37.67	2.667	35.000		ug/L
Ru	99	15.00	15.000	0.000		ug/L
Pd	105	3140.35	933.507	2206.838		ug/L
Sn	118	200.00	43.334	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
[>	Ga	71		99.407
[	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: CCV
Sample Date/Time: Tuesday, April 28, 2009 11:27:35
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\CCV.021
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	479168.56	479168.561			ug/L
	As	75	64360.38	0.138	**49.1604**	1.306	ug/L
	Cl	35	40631529.29	-4033205.221			ug/L
	Kr	83	36.89	1.889			ug/L
	Ru	99	30.00	30.000			ug/L
	Pd	105	2806.94	600.105			ug/L
	Sn	118	180.00	23.334			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	485179.39	485179.395	481999.431		ug/L
As	75	64184.29	0.136	-1948.783	**48.43491**	ug/L
Cl	35	42181763.57	-2482970.939	44664734.514		ug/L
Kr	83	41.33	6.333	35.000		ug/L
Ru	99	20.00	20.000	0.000		ug/L
Pd	105	2680.25	473.414	2206.838		ug/L
Sn	118	170.00	13.333	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	471806.48	471806.482	481999.431		ug/L
As	75	64036.39	0.140	-1948.783	**49.65567**	ug/L
Cl	35	40154034.88	-4510699.633	44664734.514		ug/L
Kr	83	33.00	-2.000	35.000		ug/L
Ru	99	40.00	40.000	0.000		ug/L
Pd	105	2820.28	613.440	2206.838		ug/L
Sn	118	180.00	23.334	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	480519.81	480519.807	481999.431		ug/L
As	75	64860.46	0.139	-1948.783	**49.39057**	ug/L
Cl	35	39558789.42	-5105945.093	44664734.514		ug/L
Kr	83	36.33	1.333	35.000		ug/L
Ru	99	30.00	30.000	0.000		ug/L
Pd	105	2920.30	713.461	2206.838		ug/L
Sn	118	190.00	33.334	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
>	Ga	71	-	99.413
	As	75	98.321	
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Quantitative Analysis - Summary Report
Sample ID: CCB
Sample Date/Time: Tuesday, April 28, 2009 11:29:29
Solution Type: QC Std
Blank File: C:\Elandata\DataSet\118E\Cal Blank.001
Number of Replicates: 3
Method File: C:\elandata\Method\SVL-6020 fast.mth
Dataset File: C:\Elandata\DataSet\118E\CCB.022
Tuning File: C:\Elandata\Tuning\118.tun
Optimization File: C:\elandata\Optimize\Default.dac
Calibration File:
Calibration Type: External Calibration

Concentration Results (Peak Hopping, Dual Mode)

	Analyte	Mass	Measured Intensity	Net Intens. Mean	**Conc. Mean**	Conc. RSD	Report Units
>	Ga	71	479795.43	479795.427			ug/L
	As	75	-1931.88	0.000	**0.0059**	753.304	ug/L
	Cl	35	42446935.23	-2217799.285			ug/L
	Kr	83	34.11	-0.889			ug/L
	Ru	99	0.00	0.000			ug/L
	Pd	105	2526.89	320.053			ug/L
	Sn	118	146.67	-10.000			ug/L

Replicates

Replicate 1

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	480997.49	480997.486	481999.431		ug/L
As	75	-1928.09	0.000	-1948.783	**0.01229**	ug/L
Cl	35	43528019.66	-1136714.851	44664734.514		ug/L
Kr	83	33.67	-1.333	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2330.19	123.352	2206.838		ug/L
Sn	118	160.00	3.333	156.668		ug/L

Replicate 2

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	479851.91	479851.911	481999.431		ug/L
As	75	-1877.30	0.000	-1948.783	**0.04650**	ug/L
Cl	35	41923082.14	-2741652.377	44664734.514		ug/L
Kr	83	31.67	-3.333	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2700.26	493.417	2206.838		ug/L
Sn	118	70.00	-86.667	156.668		ug/L

Replicate 3

Analyte	Mass	Meas. Intensity	Net Intensity	Blank Intensity	**Concentration**	Report Unit
Ga	71	478536.89	478536.885	481999.431		ug/L
As	75	-1990.27	-0.000	-1948.783	**-0.04119**	ug/L
Cl	35	41889703.89	-2775030.627	44664734.514		ug/L
Kr	83	37.00	2.000	35.000		ug/L
Ru	99	0.00	0.000	0.000		ug/L
Pd	105	2550.23	343.390	2206.838		ug/L
Sn	118	210.00	53.334	156.668		ug/L

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery
[>	Ga	71		99.543
[	As	75		
	Cl	35		
	Kr	83		
	Ru	99		
	Pd	105		
	Sn	118		

QC Out Of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

SVL ANALYTICAL
One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

1/29

ICP Color Sheet

Client: Golder Associates (AZ)

Batch	SDG Number	Case Number
W917173	9D0298	

Matrix: Water **Prepared using: SOP 4080 (EPA 3005)**

Lab Number	Client ID	pH <2	COLOR Before	COLOR After	CLARITY Before	CLARITY After	TEXTURE	ARTIFACT (Y/N) *	PREP wgt/vol
W917173-BLK1	Blank								
W917173-BS1	LCS								
W917173-MS1	Matrix Spike								
W917173-MSD1	MS Dup							04/29/2009	
W9D0298-01	SIEVE DRB	yes	colorless	colorless	clear	clear	NA	N	57 ml

04/29/2009

COLOR : red, blue, yellow, green, orange, violet, white, colorless, brown, grey, black
CLARITY : clear, cloudy, opaque
TEXTURE : fine (powdery), medium (sand), coarse (large crystals or rocks)

* If artifacts are found, report "yes" and describe in the space below:

04/29/2009

W917173

SVL ANALYTICAL

Log/Preparation Bench Sheet

See Extraction Comments

W917173

ICP4080

130

Matrix: Water
Prepared using: SOP 4080 (EPA 3005)

Earliest Due: 04/29/09 Earliest Expiration: 09/30/09 17:00

			Origin	Hold Time Expires	Home Location	Client	Due Date
W917173-BLK1	Blank	[50mL - 50mL]					
W917173-BS1	LCS	[50mL - 50mL]	Spike 1: 09B0088				
W917173-MS1	Matrix Spike [W9D0298-01]	[50mL - 50mL]	Spike 1: 09B0088				
W917173-MSD1	MS Dup [W9D0298-01]	[50mL - 50mL]	Spike 1: 09B0088				
W9D0298-01	**A** by TR 6010B Cu Pb						29-Apr-09
ClientSample ID:	SIEVE DRB	[50mL - 50mL]	Arizona	30-Sep-09 17:00	WarmRoom 33 E	Golder Associates (AZ)	

COPY
ORIGINAL IS
BENCH SHEET

04/29/2009

Preparation Reagents

Standard	Description	Lot Number
08J0438	HCl, conc.	K2007

Standard	Description	Lot Number
09A0206	HNO3, conc.	K1408

Spike Standards

Standard	Description	Amount (µL)
09B0088	QC191115ScSn WATER DIG	500

Standard	Description	Amount (µL)

Digested By: AP Date/Time: 4/23/09 1600/2200 Instrument ID: ICP Optima ☐1 ☐5 ☒6 ☐7

Analyzed By: AS Date/Time: 4/27/09

Reviewed By: [signature] Date: 04/28/2009 Data File(s): 0917173

W916206

Log/Preparation Bench Sheet

See Extraction Comments

W916206

MS 4078 ,3

Matrix: Water
Prepared using: SOP 4078 (3020A ICPMS)

Earliest Due: 04/29/09 Earliest Expiration: 09/30/09 17:00

			Origin	Hold Time Expires	Home Location	Client	Due Date
W916206-BLK1	Blank	[50mL - 50mL]					
W916206-BS1	LCS	[50mL - 50mL]	Spike 1: 09D0031				
W916206-MS1	Matrix Spike [W9D0298-01]	[50mL - 50mL]	Spike 1: 09D0031				
W916206-MSD1	MS Dup [W9D0298-01]	[50mL - 50mL]	Spike 1: 09D0031				
W9D0298-01	**A** by TR 6020 As						29-Apr-09
ClientSample ID:	SIEVE DRB	[50mL - 50mL]	Arizona	30-Sep-09 17:00	WarmRoom 33 E	Golder Associates (AZ)	

COPY, IS ORIGINAL BENCH SHEET

04/29/2009

Preparation Reagents

Standard	Description	Lot Number
09A0206	HNO3, conc.	K1408

Standard	Description	Lot Number

Spike Standards

Standard	Description	Amount (µL)
09D0031	F-26+U	500

Standard	Description	Amount (µL)

Digested By: DT Date/Time: 4/16/09 1700/2300 Instrument ID: PE ICPMS DRC-E

Analyzed By: KWB Date/Time: 4/28/09

Reviewed By: KWB Date: 04/28/2009 Data File(s): 118E

Instrument operating conditions and parameters for this analytical batch are as stated in

137

From: Origin ID: TUSA (520) 888-8818
Administrative Assistant
Golder Associates Inc
4730 North Oracle Rd
Suite 210
Tucson, AZ 85705

FedEx Express

J9011090130202J

Ship Date: 14APR09
ActWgt: 54.0 LB
CAD: 7386486/INET9011
Account#: S *********

Delivery Address Bar Code

Ref # 07392519.2
Invoice #
PO #
Dept #

SHIP TO: (208) 784-1258 BILL SENDER

Kirby Gray
SVL Analytical
One Government Gulch

Kellogg, ID 83837

TRK# 0201 7975 0719 3515

WED - 15APR PM
PRIORITY OVERNIGHT

X3 COEA

83837
ID-US
GEG

Cooler 2
5.0°

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic valueof the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

WA0298

133

From: Origin ID: TUSA (520) 888-8818
Administrative Assistant
Golder Associates Inc
4730 North Oracle Rd
Suite 210
Tucson, AZ 85705

FedEx Express

J9011090130202 3

Ship Date: 14APR09
ActWgt: 62.0 LB
CAD: 7386486/INET9011
Account#: S *********

Delivery Address Bar Code

Ref # 07392519.2
Invoice #
PO #
Dept #

SHIP TO: (208) 784-1258 BILL SENDER

Kirby Gray
SVL Analytical
One Government Gulch

Kellogg, ID 83837

TRK# 0201 7975 0719 5140

WED - 15APR PM
PRIORITY OVERNIGHT

X3 COEA

83837
ID-US
GEG

Cooler 1
5.2°

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic valueof the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

WA96298

Page 2 of 2

CHAIN OF CUSTODY RECORD

SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX: (208) 783-0891

FOR SVL USE ONLY
SVL JOB #

TEMP on Receipt: W9D0298

Table 1. – Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other_____

Report to Company:	GOLDER ASSOCIATES INC
Contact:	ORESTES MORFIN
Address:	4730 N. ORACLE #210 TUCSON AZ 85705
Phone Number:	520-888-8818
FAX Number:	-8817
E-mail:	omorfin@golder.com
Invoice Sent To:	SAME
Contact:	
Address:	
Phone Number:	
FAX Number:	
PO#:	

Project Name: RCML HHRA ANOMALOUS Pb SAMPL

Sampler's Signature: Orestes Morfin

Indicate State of sample origination: AZ **USACE?** ☐ Yes ☐ No

	Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Misc. Matrix Type (From Table 1)	Misc. No. of Containers	Preservative(s) Unpreserved	HNO_3 Filtered	HNO_3 Unfiltered	HCl	H_2SO_4	NaOH	Other (Specify) ICE	Analyses Required: TOTAL METALS FOR As, Cu + Pb ON <250µm FRACTION	Analyses Required: SPLP FOR As, Cu + Pb ON BULK FRACTION	Analyses Required: AQUEOUS ANALYSIS FOR Cu, As + Pb	Analyses Required: SEE ATTACHED TABLE 1	Rush Instructions (Days)	Comments
	Please take care to distinguish between: 1 and I, 2 and Z, 5 and S, Ø and O. Thanks!																		
1	EMF-Ø7HHRA-BFD2	4/3/09	12³⁰	OM	3	1							✓	✓	✓				• STANDARD 20:1 RATIO FOR SPLP • EPA LEVEL III REPORTING • NORMAL T.A.T • SPLIT SAMPLE, + SIEVE 1 SPLIT TO <250µm FOR TOTAL METALS ANALYSIS
2	SIEVE DRB	"	17⁰⁰	OM	4	1			✓							✓			• DELIVER RESULTS IN E-FORM & PDF TO GOLDER
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Relinquished by:	Orestes Morfin	Date: 4/14/09	Time: 16⁰⁰	Received by:	R. Stribling	Date: 4/15/09	Time: 14:50
Relinquished by:		Date:	Time:	Received by:		Date:	Time:

* Sample Reject: ☐ Return ☐ Dispose ☐ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SVL-COC 9/05

COPY

CHAIN OF CUSTODY RECORD

SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX: (208) 783-0891

FOR SVL USE ONLY
SVL JOB # W9D0298

TEMP on Receipt:

Table 1. – Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other RCRA HHRA

Report to Company:	GOLDER ASSOCIATES INC.
Contact:	ORESTES MORFIN
Address:	4730 N. ORACLE #210 TUCSON AZ 85705
Phone Number:	520-888-8818
FAX Number:	-8817
E-mail:	omorfin@golder.com
Invoice Sent To:	SAME
Contact:	
Address:	
Phone Number:	
FAX Number:	
PO#:	

Project Name: ANOMALOUS Pb SAMP

Sampler's Signature: Orestes Morfin

Indicate State of sample origination: AZ **USACE?** ☐ Yes ☐ No

	Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Misc. Matrix Type (From Table 1)	Misc. No. of Containers	Preservative(s) Unpreserved	HNO_3 Filtered	HNO_3 Unfiltered	HCl	H_2SO_4	NaOH	Other (Specify) ICE	Analyses Required: TOTAL METALS FOR As, Cu + Pb ON < 250 MICRON FRACTION	Analyses Required: SPLP FOR As, Cu + Pb ON BULK FRACTION	Analyses Required: SEE ATTACHED TABLE 1	Rush Instructions (Days)
1	NMF-Ø7HHRA-ØØ5S1	4/3/09	1115	OM	3	1								✓	✓		
2	-ØØ5E1	"	1100	OM													
3	EMF-Ø7HHRA-ØØ2N1	4/2/09	850														
4	-ØØ2S1		855														
5	-ØØ4N1		1050														
6	-ØØ4W1		1055														
7	-ØØ3N1		1320														
8	-ØØ3W1		1315														
9	-ØØ5N1		1520														
10	-ØØ5E1		1545														

Comments
- STANDARD 20:1 RATIO FOR SPLP
- EPA LEVEL III REPORTING
- NORMAL T.A.T
- SPLIT SAMPLE, + SIEVE 1 SPLIT TO <250µm FOR TOTAL METALS ANALYSIS
- DELIVER RESULTS IN E-FORM & PDF TO GOLDER

Archive remaining sample

COOLER 1 — COOLER 2

Relinquished by:	Orestes Morfin	Date: 4/14/09	Time: 1600	Received by:	R. Stalding
Relinquished by:		Date:	Time:	Received by:	
		Date: 4/15/09	Time: 14:50		

* Sample Reject: ☐ Return ☐ Dispose ☐ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SVL-COC 9/

COPY

Table 1

Tier 2 Analytical Suite for RCML HHRA Solid Samples and Decontamination Rinseate Blanks

Constituent	Arizona Residential SRL (mg/kg)	Arizona Non-residential SRL (mg/kg)	Minimum GPL (mg/kg)	AWQS (mg/L)	Total Metals Analysis (<250 µm fraction)		Aqueous* Analysis	
					Analytical Method	PQL (mg/kg)	Analytical Method	PQL (mg/L)
Arsenic	10	10	290	0.05	EPA 6010 ICP	2.5	EPA 6020 ICP-MS	0.003
Copper	3,100	41,000	NS	NS	EPA 6010 ICP	1.0	EPA 6010 ICP	0.01
Lead	400	800	290	0.05	EPA 6010 ICP	0.75	EPA 6010 ICP	0.0075

Notes:

SRL = soil remediation level

GPL = groundwater protection level

AWQS = aquifer water quality standard

*Includes synthetic precipitation leaching procedure and decontamination rinseate blanks (DRBs)

PQL = practical quantitation limit

mg/kg = milligrams per kilogram

mg/L = milligrams per liter

EPA = US Environmental Protection Agency

NS = no standard

COPY

SAMPLE LOG-IN SHEET

137

Lab Name	SVL ANALYTICAL	Page 1 of 1
Received By (Print Name)	R. STRIBLING	Log-in Date 04/15/2009
Received By (Signature)	R. Stribling/CRS	
Case Number	Sample Delivery Group No. W9D0298	NRAS Number NA

Remarks:

1. Custody Seal(s) — Present/Absent* Intact/Broken 04/15/2009
2. Custody Seal Nos. — NA
3. Traffic Reports/Chain of Custody Records or Packing Lists — Present/Absent*
4. Airbill — Airbill/Sticker Present/Absent*
5. Airbill No. — 797507193515
6. Sample Tags — Present/Absent*
   Sample Tag Numbers — Listed/Not Listed on Chain of Custody Record
7. Sample Condition — Intact/Broken*/Leaking
8. Cooler Temperature Indicator Bottle — Present/Absent*
9. Cooler Temperature — 3.2 °C
10. Does information on Chain of Custody Records and sample tags agree? — Yes/No*
11. Date Received at Lab — 04/15/2009
12. Time Received — 1450

EPA Sample #	Aqueous Sample pH	Corresponding Sample Tag #	Corresponding Assigned Lab #	Remarks: Condition of Sample Shipment, etc.
SIEVE DRB		04/15/2009	SIEVE DRB	INTACT

Sample Transfer

Fraction	N/A	Fraction	N/A
Area #	N/A	Area #	N/A
By	N/A	By	N/A
On	N/A	On	N/A

04/15/2009 CRS

* Contact SMO and attach record of resolution

Reviewed By	Ricky Seay	N/A	Logbook No. N/A
Date	04/15/2009	N/A	Logbook Page No. N/A

Contract Laboratory Program

Sample Delivery Group (SDG) Cover Sheet

SDG Number: 9D0298

☐ ICP-AES Analysis

☐ ICP-MS Analysis

Laboratory Name: SOLANALYTICAL

Laboratory Code: _____

Contract No.: _____

Case No.: _____

Analysis Price: _____

SDG Turnaround: _____

Modified Analysis (if applicable):

Modification Reference No.: _____

USEPA Sample Numbers in SDG (Listed in Numerical Order)

1) SIEVE DRB	7)	13)	19)
2)	8)	14)	20)
3)	9)	15)	21)
4)	10)	16)	22)
5)	11)	17)	23)
6)	12)	18)	24)

SIEVE DRB
First Sample in SDG

SIEVE DRB
Last Sample in SDG

04/15/2009
First Sample Receipt Date

04/15/2009
Last Sample Receipt Date

Note: There are a maximum of 20 field samples (excluding PE samples) in an SDG. Attach the TR/COC Records to this form in alphanumeric order (the order listed above on this form).

Signature: _____ Date: 04/15/2009

SAMPLE RECEIPT/CHAIN-OF -CUSTODY CHECKLIST

The following items were checked for completeness, correctness, and compliance to project specifications using the Chain-of-Custody (COC) and other supporting information.

Date of acceptance: 4/15/09 **By:** [signature]

SVL Work No: W9D0298

Item	Description	V	VC	NV	NA	Comments
1	Client or project name	✓				Golder
2	Date and time of receipt at lab	✓				4/15/09 14:50
3	Received by	✓				ROBIN STRIBLING
4	Temperature blank or cooler temperature	✓				Temp. 5.2° °C. , 3.2° Two coolers
5	Were the sample(s) received on ice	✓				yes
6	Custody tape/bottle seals	✓				NO
7	Condition of samples upon receipt (leaking; bubbles in VOA vials	✓				GOOD
8	Sample numbers/IDs agree with COC	✓				
9	Sample date & time agree with COC	✓				
10	Number of containers for each sample	✓				
11	The correct preservative for the analysis requested	✓				HNO3 bottle checked and <2
12	Did an SVL employee preserve sample(s) upon receipt				✓	
12	Type of container for each sample / volume received	✓				
13	Analysis requested for each sample	✓				
14	Sample matrix description	✓				
15	COC properly completed & legible	✓				
16	Corrections properly made (initials & date)				✓	
17	Additional comments or records of sample condition or treatment (unlisted or missing samples at laboratory, aliquot taken, sample hold, samples subcontracted, communications between client and laboratory)				✓	
18	Shipper's air bill	✓				

V- Verified **VC- Verified Corrections Made** **NV-Not Verified** **NA- Not Applicable**

Additional Comments: ______________________________

Analytical Run Log
ICP-OES

Data File: 09117A

140

	Date	Time	Job Number	Instrument	Analyst
Calib Blank 1	4/27/2009	2:47:18 PM			AS
STD1	4/27/2009	2:53:00 PM			AS
STD2	4/27/2009	2:58:39 PM			AS
STD3	4/27/2009	3:03:09 PM			AS
STD4	4/27/2009	3:07:23 PM			AS
STD5	4/27/2009	3:11:22 PM			AS
ICV	4/27/2009	3:15:46 PM			AS
ICB	4/27/2009	3:21:23 PM			AS
CRI	4/27/2009	3:27:05 PM			AS
ICSA	4/27/2009	3:32:46 PM			AS
ICSAB	4/27/2009	3:38:44 PM			AS
CCV	4/27/2009	3:44:38 PM			AS
CCB	4/27/2009	3:50:22 PM			AS
W917173-BLK1	4/27/2009	3:57:16 PM			AS
W917173-BS1	4/27/2009	4:02:59 PM			AS
W9D0298-01	4/27/2009	4:09:00 PM	W917173	OPT6	AS
W917173-MS1	4/27/2009	4:14:40 PM	W917173	OPT6	AS
W917173-MSD1	4/27/2009	4:20:48 PM	W917173	OPT6	AS
CCV	4/27/2009	4:26:55 PM			AS
CCB	4/27/2009	4:32:31 PM			AS

04/29/2009

Dataset Report

141

User Name: Kevin
Computer Name: 107-ICPMS
Dataset File Path: C:\Elandata\DataSet\118E\
Report Date/Time: Tuesday, April 28, 2009 11:33:03

The Dataset

Batch ID	Sample ID	Date and Time	Read Type	Samp. File Name	Dilution ~~Description~~ KS 04/28/2009
	Cal Blank	10:49:46 Tue 28-Apr-09	Blank	Cal Blank.001	
	Cal Std 1	10:51:39 Tue 28-Apr-09	Standard #1	Cal Std 1.002	
	Cal Std 2	10:53:33 Tue 28-Apr-09	Standard #2	Cal Std 2.003	
	Cal Std 3	10:55:26 Tue 28-Apr-09	Standard #3	Cal Std 3.004	
	Cal Std 4	10:57:19 Tue 28-Apr-09	Standard #4	Cal Std 4.005	
	Cal Std 5	10:59:12 Tue 28-Apr-09	Standard #5	Cal Std 5.006	
	Cal Std 6	11:01:05 Tue 28-Apr-09	Standard #6	Cal Std 6.007	
	ICV	11:02:59 Tue 28-Apr-09	QC Std #1	ICV.008	
	ICB	11:04:52 Tue 28-Apr-09	QC Std #2	ICB.009	
	RCLS	11:06:46 Tue 28-Apr-09	QC Std #3	RCLS.010	
	ICSA	11:08:39 Tue 28-Apr-09	QC Std #4	ICSA.011	
	ICSAB	11:10:33 Tue 28-Apr-09	QC Std #5	ICSAB.012	
	CCV	11:12:26 Tue 28-Apr-09	QC Std #6	CCV.013	
	CCB	11:14:20 Tue 28-Apr-09	QC Std #7	CCB.014	
W916206	W916206-BLK1	11:16:14 Tue 28-Apr-09	Sample	W916206-BLK1.015	2.5
	W916206-BS1	11:18:08 Tue 28-Apr-09	Sample	W916206-BS1.016	2.5
	W9D0298-01	11:20:01 Tue 28-Apr-09	Sample	W9D0298-01.017	2.5
	W916206-L1	11:21:55 Tue 28-Apr-09	Sample	W916206-L1.018	12.5
	W916206-MS1	11:23:48 Tue 28-Apr-09	Sample	W916206-MS1.019	2.5
	W916206-MSD1	11:25:41 Tue 28-Apr-09	Sample	W916206-MSD1.020	2.5
	CCV	11:27:35 Tue 28-Apr-09	QC Std #6	CCV.021	
	CCB	11:29:29 Tue 28-Apr-09	QC Std #7	CCB.022	

APPENDIX D
RISK-BASED SCREENING LEVEL CALCULATIONS IN SUPPORT OF DATA ADEQUACY EVALUATIONS
ON CD

REPORT

Appendix D

RISK-BASED SCREENING LEVEL CALCULATIONS IN SUPPORT OF DATA ADEQUACY EVALUATIONS

West Plant Site, Superior, Arizona

Submitted To: Resolution Copper Mining LLC
102 Magma Heights
Superior, Arizona 85273

Submitted By: Golder Associates Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052 U

December 1, 2011

Project No. 073-92519-02.001

A world of capabilities delivered locally

Golder Associates

Table of Contents

List of Tables

Attachments

Attachment A VSP Reports

ACRONYM AND ABBREVIATION LIST

Acronym	Definition
AAC	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Health Services
AEL	acceptable exposure level
AOC	Administrative Order on Consent
APP	Aquifer Protection Permit
AsMO	arsenic metal oxides
ATc	averaging time for carcinogens
ATnc	averaging time for noncarcinogens
BHP	BHP-Billiton
BW	body weight
CF	conversion factor
Chino	Chino, New Mexico
COC	constituents of concern
ED	exposure duration
EF	exposure frequency
EMF	East Mountain Front
EPA	U.S. Environmental Protection Agency
FS	fraction of soil
FSP	field sampling plan
Golder	Golder Associates, Inc.
Gradient	Gradient Corporation
HHRA	human health risk assessment
HQ	hazard quotient
IA	industrial area
ICR	incremental cancer risk
IR	ingestion rate
IRIS	Integrated Risk Information System
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MCLG	maximum contaminant goal
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MSHA	Mine Safety and Health Administration
N	New Mexico
NMED	New Mexico Environmental Department
NMF	North Mountain Front
NOAEL	no observable adverse effect level
RBSL	Risk-based screening levels
RCML	Resolution Copper Mining LLC
RfD	reference dose
SF	slope factor
SKW	Silver King Wash
SSSRLs	Site-Specific Soil Screening Levels
UCL	upper confidence limit
VRP	Voluntary Remediation Program
VSP	Visual Sampling Plan

1.0 INTRODUCTION

This evaluation provides a summary of calculations developed in support of evaluating the adequacy of the data used in the Site Characterization Report prepared by Golder Associates Inc. (Golder 2011) on behalf of the Resolution Copper Mining LLC (RCML) for smelter impacted soil at West Plant Site, Superior, Arizona (Figure 1-1 of the Site Characterization Report).

The Site Characterization Report provides a summary of the relevant environmental data available for the site, and a proposed approach for a probabilistic human health risk evaluation to be used to develop Site-Specific Soil Screening Levels (SSSRLs) in accordance with Arizona Administrative Code (AAC) R18-7-206, under the regulatory authority of the Arizona Department of Environmental Quality (ADEQ) Voluntary Remediation Program (VRP). A data adequacy evaluation is included in the report that compares site data to a series of risk-based screening levels (RBSLs) to determine whether sufficient analytical data are present for each land area at the West Plant Site. Risk-based calculations were developed primarily using standard default exposure assumptions and deterministic methodology to calculate potential human health risks, and subsequent RBSLs. The RBSLs are used as an input to represent a fixed threshold (i.e., site-specific action level) in the algorithm used to evaluate the adequacy of the existing number of samples using Visual Sampling Protocol (VSP) software. The RBSLs are intended for no other purpose.

Smelter-affected soil at the West Plant Site was previously regulated under RCML's area-wide Aquifer Protection Permit (APP) No. P-101703 administered by ADEQ. RCML elected to switch regulatory authority for smelter-affected soil from APP to VRP in 2010. Preliminary risk calculations were previously developed and submitted to the APP (Golder 2007, 2008). RCML has elected, in the period after submittal of previous risk calculations, to limit the accessibility of the land areas surrounding the West Plant Site. Therefore the types of receptors and the exposure assumptions included in the previous calculations are outdated, and the resulting risk-based action levels are no longer relevant to the site.

Rather than reviewing out-of-date risk calculations from the previous documents, RCML determined it would be beneficial to recalculate the RBSLs based on current conditions, and re-evaluate the adequacy of the data used in the Site Characterization Report based on the current RBSLs. The current RBSLs are presented in this report using the current exposure assumptions and receptors reported in the Site Characterization Report.

2.0 SITE INFORMATION AND DATA USED IN DEVELOPMENT OF RBSL

The conceptual site model for the West Plant Site is presented in the Site Characterization Report. The land areas within the West Plant Site, analytical data used in this evaluation, exposure scenarios, toxicity criteria, and preliminary risk calculations are presented in this section.

2.1 Land Areas

The West Plant Site is divided into four land areas for risk evaluation purposes, largely based on contaminant concentrations, topography, and accessibility, as shown in Figure 2-1 of the Site Characterization Report. Public access in all of the land areas is illegal and restricted. Industrial workers can access all land areas, although the frequency of use varies by the need for access and the ruggedness of the terrain, and on-site exposure is minimal. Illegal trespassers may gain access to some parts of the site, with varying accessibility despite RCML's efforts to prevent trespassing. Based on these parameters, the four land areas were assigned potential receptors and exposure categories for the risk evaluation:

- East Mountain Front Area (EMF) – Access to the EMF is controlled by mine security, and limited access over rugged terrain. Low-level use industrial workers (adults) and low-level use trespassers (teenagers and adults) are evaluated for this area.
- Industrial Area (IA) – The IA is an operating mine site. Public access is minimal, and actively restricted by mine security and fencing. Regular work shift industrial workers (adults) and low-level use trespassers (teenagers and adults) are evaluated for this area. Within the Industrial Area, RCML defined a "stack zone" bounded by the 500 milligrams per kilogram (mg/kg) isopleth for arsenic. This is a minimum zone in which the decision to remediate is inevitable, and no additional data are needed to make the decision or reduce the uncertainty regarding the decision.
- North Mountain Front Area (NMF) – The NMF is located in extremely difficult and treacherous terrain and desert vegetation. Infrequent use industrial workers (adults) and infrequent use trespassers (teenagers to adults) are evaluated for this area.
- Silver King Wash Area (SKW) – This small area is where a wash flows though the northwest corner of the site. The SKW area has few visitors. Occasional visitors include trespassers with all-terrain vehicles. Low-level use industrial workers (adults) and low-level use trespassers (pre-teenagers to adults) are evaluated for this area.

RCML has selected the current and reasonably foreseeable future land use for the West Plant Site to be industrial use, in accordance with AAC R18-16-406(G). Industrial workers are present at varying levels of frequency in each land area. In the Industrial Area, workers are present on a typical work day. Industrial workers may visit the remaining areas infrequently, at varying levels of contact.

RCML had previously considered allowing recreational use of some portions of the West Plant Site by outside parties. In that light, previous studies of the West Plant Site conducted by Golder (2007, 2008) evaluated potential use of some portions of the site by recreators. RCML has since re-evaluated their

options, and have determined that the land use for the entire site will be industrial, and that any non-industrial use of the site will be considered trespassing.

2.2 Identification of Constituents of Concern

Section 4.3 of the Site Characterization report details the datasets used to identify the constituents of concern (COCs) for the West Plant Site. Based on soil data collected across the West Plant Site, arsenic, copper, and lead were retained as COCs. The EPA has not published toxicity criteria for lead, therefore lead is not evaluated in this risk-based determination. The approach to evaluating lead is presented in Section 4.3.3.2 of the Site Characterization Report.

Table 2-1 presents the analytical data for each land area used in the risk calculations and development of the RBSL. Table 2-2 presents the descriptive statistics calculated for the data sets used for each land use for the preliminary risk assessment, including the 95% upper confidence limit (UCL). The 95% UCL was used as the representative exposure concentrations for each land use area. Note that the Industrial Area was analyzed excluding the samples collected in the 'stack zone'.

2.3 Potential Receptors

The potential receptors for constituents at the West Plant Site are summarized below for each land area. The land use is industrial; therefore, industrial workers may be present on any of the land areas. However, the frequency and duration of access will vary with each land area. A summary of the receptors for each land area is provided in the list below.

Land Area	Receptors
Industrial Area	Industrial Worker, Regular Work Shift (adults)
	Trespasser, Low Level Use (teenagers to adults)
East Mountain Front Area	Industrial Worker, Low Level Use (adults)
	Trespasser, Low Level Use (teenagers to adults)
North Mountain Front Area	Industrial Worker, Infrequent Use (adults)
	Trespasser, Infrequent Use (teenagers to adults)
Silver King Wash Area	Industrial Worker, Low Level Use (adults)
	Trespasser, Low Level Use (pre-teenagers to adults)

2.4 Exposure Scenarios

The exposure scenarios for the West Plant Site are selected based on the probable future land uses at the site, as described in Section 2.1. Two exposure scenarios related to future land use were selected for risk assessment: industrial and trespasser. These exposure scenarios are described as follows:

- **Industrial Area Industrial Worker Scenario** – The West Plant Site will be used as a staging, disposal, or processing area for mining activities. Adult workers are present during shift hours, operating under Mine Safety and Health Administration (MSHA)

standards. The industrial scenario considers adults with exposures occurring during normal work shifts.

- **Industrial Area Trespasser Scenario** – Trespassers may enter the area illegally, access is limited and activity restricted. There is rough topography and limited points of access in this area. Children are not likely to be present in this area. Teenager and adult trespassers may potentially trespass in this area, and are evaluated in this scenario.
- **East Mountain Front Industrial Worker Scenario** – Adult workers are occasionally present during shift hours, operating under MSHA standards. The industrial scenario considers adults with low-level exposures occurring during normal work shifts.
- **East Mountain Front Trespasser Scenario** – Trespasser uses include nature-related activities such as hiking and walking. Due to the rough topography, children are not likely to be present in this area. Teenager to adult trespassers are evaluated in this exposure scenario.
- **North Mountain Front Industrial Worker Scenario** – Adult workers are infrequently present during shift hours, operating under MSHA standards. The industrial scenario considers adults with low-level exposures occurring during normal work shifts.
- **North Mountain Front Rugged Terrain Trespasser Scenario** – Public access is illegal, and the terrain is difficult to access and to traverse because of steep slopes and rocky outcrops. Some use may occur illegally (e.g., hunting), but the frequency and duration of use would be less than if allowed or promoted. Further reductions in frequency and duration of use would be expected because of the rugged terrain and seasonal heat. This area is not conducive to most activities outside of rugged terrain (i.e., high difficulty) hiking and climbing by physically fit adults that are not young or old. For this reason, only teenagers and adults are likely to be trespassing in this land use area.
- **Silver King Wash Industrial Worker Scenario** – Adult workers are occasionally present during shift hours, operating under MSHA standards. The industrial scenario considers adults with low-level exposures occurring during normal work shifts.
- **Silver King Wash Trespasser Scenario** – All activities are prohibited; however, some use may still occur illegally (e.g., horseback riding, recreational vehicles), but the frequency and duration of use would be less than if they were allowed. Limited points of access naturally restrict the frequency and duration of exposure for the people who trespass in this area. Pre-teenagers to adult trespassers are evaluated. Since access in this area is typically via horseback or all-terrain vehicle, and children under 6 years of age typically do not operate these without supervision, children under 6 years old are not evaluated.

2.5 Toxicity Criteria

The toxicity criteria for arsenic and copper are described in this section and summarized on Table 2-3. The United States Environmental Protection Agency (EPA) has not established toxicity criteria for lead (EPA 2008). However, lead can be evaluated by comparison to the Arizona nonresidential soil remediation level of 800 mg/kg.

2.5.1 Arsenic

The EPA provides an oral Reference Dose (RfD) for arsenic of 0.0003 mg/kg/day in their Integrated Risk Information System database (IRIS; http://www.epa.gov/IRIS/index.html). The arsenic RfD is based on evidence of hyperpigmentation, keratosis, and possible vascular complications. The RfD was derived

from a study of population of Taiwanese that were chronically exposed to drinking water and food containing arsenic. The EPA estimated a No Observed Adverse Effect Level (NOAEL) of 0.0008 mg/kg/day for skin lesions from the Taiwanese study based on the drinking water concentration (0.009 mg/L), a drinking water ingestion rate of 4.5 L/day, a food arsenic intake rate of 0.002 mg/day, an average Taiwanese body weight of 55 kg as :

$$\text{NOAEL } 0.0008 \text{ mg/kg/day} = \frac{(0.009 \text{ mg/L} \times 4.5 \text{ L/day}) + 0.002 \text{ mg/day}}{55 \text{ kg}}$$

An uncertainty factor of 3 was applied to the NOAEL (based on the lack of reproductive toxicity data and uncertainty associated with sensitive individuals) to derive the RfD of 0.0003 mg/kg/day as:

$$\text{RfD } 0.0003 \text{ mg/kg/day} = \frac{0.0008 \text{ mg/kg/day}}{3}$$

Arsenic is a carcinogenic constituent with a weight of carcinogenicity of “A”. This classification is given based on sufficient evidence of carcinogenicity in human populations. The ingestion of arsenic in drinking water has been associated with skin, bladder, and some possible internal cancers. The EPA’s IRIS database recommends a cancer oral slope factor (SF) of 1.5 (mg/kg/day)-1 for arsenic. The SF is derived from a multistage model of skin cancer rates in the Taiwanese study used for the arsenic oral RfD, assuming a drinking water ingestion rate of 3.5 L/day for Taiwanese males and 2 L/day for Taiwanese females, and average Taiwanese body weight of 55 kg, and an average American body weight of 70 kg.

The oral RfD and oral SF for arsenic are each derived in part from observed effects of individuals that ingested arsenic in drinking water (i.e., in solution). When applying these toxicity criteria to ingestion of arsenic in soil, the solubility of arsenic in the soil needs to be considered. Bioavailability in smelter-affected soil is largely controlled by the solubility of the arsenic metal oxides (AsMO) phase. Studies conducted at the Anaconda Smelter Superfund Site showed that AsMO is generally insoluble during passage through the monkey gastrointestinal tract, which was corroborated by equilibrium geochemical modeling, in vitro studies, and further in vivo studies (EPA 1996b). The Anaconda site applied a bioavailability factor of 18.3% to the soil cleanup standard for that site (EPA 1998). However, based on discussions with ADEQ, a bioavailability factor of 40% will be used in this RBSL calculation for the West Plant Site.

2.5.2 Copper

The EPA does not provide an oral RfD for copper in IRIS (http://www.epa.gov/IRIS/index.html). However, a remedial action for copper in soil at the Chino Mines Company (Chino) smelter site in Hurley, New Mexico (NM) was conducted using an alternative copper criterion that was developed for the purpose of developing a risk-based remedial action criterion for copper. Chino evaluated potential human health effects in the town of Hurley from historical mineral processing operations at the Hurley smelter as part of

the Administrative Order on Consent (AOC) with the New Mexico Environment Department (NMED). As part of this evaluation, NMED retained Gradient Corporation (Gradient) to conduct a human health risk assessment (HHRA) for the town of Hurley. Copper was the primary risk driver for the town of Hurley. In order to evaluate human health risks for copper in Hurley soil, Gradient developed an acceptable exposure level (AEL) for copper based on available literature and studies on copper toxicity.

There are several studies that report gastrointestinal health effects from the ingestion of copper, including vomiting, nausea, and abdominal pain. An early study by Wyllie (1957) reported a group of nurses that experienced acute gastrointestinal effects (nausea, vomiting and diarrhea) after drinking a beverage stored in a cocktail shaker in which the inner copper plating that had worn off, resulting in dissolution of copper into their beverage. Wyllie estimated the LOAEL from that event was 5.3 mg copper.

The EPA established a Maximum Contaminant Goal (MCLG) for copper of 1.3 mg/L. The MCLG was derived from the LOAEL of 5.3 mg/day from Wyllie (1957), an uncertainty factor of 2, and a daily drinking water rate of 2 L/day as:

$$\text{MCLG (1.3 mg/L)} = \frac{\text{5.3 mg/day}}{\text{2 L/day x 2}}$$

The EPA recommended an interim oral RfD for copper of 0.04 mg/kg/day (EPA 1991). The intake level of 0.04 mg/kg/day corresponds to the daily dose from the MCLG as:

$$\text{Interim RfD (0.04 mg/kg/day)} = \frac{\text{1.3 mg/L x 2 L/day x 1}}{\text{71.8 kg}}$$

Gradient reviewed the available literature and data on copper toxicity for the Hurley HHRA, and recommended using the interim RfD value of 0.04 mg/kg/day as an oral AEL for copper in HHRA for the town of Hurley (Gradient 2000). Since there is no information on a dermal RfD for copper, the oral Rfd (0.04 mg/kg/day) was applied to the dermal scenario.

3.0 RISK-BASED SCREENING LEVEL CALCULATION

Risk-based screening levels were developed as a review of the potential risks associated with site constituents. The RBSLs do not include a comprehensive evaluation of risks from all applicable exposure pathways. Rather, a combination of standard default exposure factors and site-specific exposure factors were selected to represent the pathways, assumptions, and resulting risks that most likely result in human health effects. The resulting estimated risks indicate the areas where further efforts will be needed, and areas where no further action is likely. Overall, the preliminary risk results are used to develop RBSLs for carcinogenic and noncarcinogenic risks at the site. The RBSLs are used to guide the sampling design by identifying where additional data are needed.

Tables 3-1 through 3-12 present the exposure assumptions for each of the receptors in each area of the West Plant Site. The RBSL calculations used exposure parameters for each applicable exposure scenario from a variety of regulatory guidance and similar smelter sites. The following sources of information were used:

- Arizona Department of Health Services (ADHS) Default (ADHS 2003) – The default parameters presented in the ADHS guidance were used as default parameters where available. The ADHS guidance does not provide parameters for trespasser scenarios.
- EPA Standard Default Factors, (EPA 1991) – The default parameters presented in this EPA guidance document provides recreational exposure factors used for trespassers.
- EPA Default Factors for Dermal Risk Assessment, (EPA 2004) – The default parameters presented in this EPA guidance document provides values for dermal exposures.

The ADHS standard default exposure parameters (where given) represent the conservative default risk calculations for the scenarios that are covered by ADHS guidance (ADHS 2003). When ADHS values are not available, EPA standard default exposure factors were used (EPA 1997, 2002, 2004). Site-specific exposure frequency assumptions were used based on observations of the land areas.

A bioavailability value for arsenic of 40% was used in the probabilistic risk assessment conducted on behalf of BHP-Billiton (BHP) Copper for the Northwest Study Area in the town of Superior, adjacent to the West Plant Site. ADEQ indicated in their comments on previous West Plant Site submittals under the APP program, that a 40% bioavailability value for arsenic should be used for the West Plant Site in order to be is consistent with the Northwest Study Area (Table 2-3).

The exposure parameters described above were used along with West Plant Site soil data to calculate various risk levels. The risk calculations for the West Plant Site were conducted based on risk assessment guidance provided by ADHS (2003) and EPA (1989, 1996a). Both carcinogenic and noncarcinogenic risks were calculated. The equations and exposure parameters used for the calculation of potential carcinogenic and noncarcinogenic risks from soil ingestion are as follows:

Carcinogenic Risk:

$$ICR = \frac{Conc \times Bio \times IR \times FS \times EF \times ED \times CF \times SF}{BW \times ATc}$$

Noncarcinogenic Risk:

$$HQ = \frac{Conc \times Bio \times IR \times FS \times EF \times ED \times CF}{BW \times ATnc \times RfD}$$

Where:

ICR = Incremental cancer risk (unitless)

HQ = Hazard quotient (unitless)

Conc = Concentration of each constituent of concern in soil (mg/kg)

Bio = Bioavailability factor (unitless)

IR = Ingestion rate (mg per day)

FS = Fraction of soil ingested from site (unitless)

EF = Exposure frequency (days per year)

ED = Exposure duration (days)

CF = Conversion factor (kilograms per milligrams)

SF = Slope factor for each carcinogenic constituents (kg per day/mg)

BW = Body weight (kg)

ATc = Averaging time for carcinogenic constituents (days)

ATnc = Averaging time for noncarcinogenic constituents (days)

RfD = Reference dose for noncarcinogenic constituents (kg per day/mg)

The equations for inhalation and dermal exposure were modified based on the ADHS (2003) guidance. The type of human receptor varies by exposure scenario. Industrial risks are calculated for adult receptors only. Trespasser risks are calculated for pre-teen or teen to adult receptors, depending on the area considered.

Arsenic and copper are considered to be the drivers for cleanup of smelter soil. Therefore, the risk calculations were conducted for arsenic and copper. Arsenic is the only metallic carcinogenic COC at the West Plant Site.

4.0 RISK RESULTS AND RISK-BASED SCREENING LEVELS

Tables 4-1 through 4-4 present the risk calculations for each of the land areas. Table 4-5 provides a summary of the screening-level risk results and Table 4-6 summarizes the corresponding RBSLs for each land use area.

The point of departure for risk management decisions is an ICR between 10^{-4} (i.e., 1 in 10,000) and 10^{-6} (i.e., 1 in 1,000,000) for carcinogenic risk and an HQ of unity for noncarcinogenic risk. Carcinogenic risk levels are calculated for the 10^{-4} (i.e., 1 in 10,000), 10^{-5} (i.e., 1 in 100,000), and 10^{-6} (i.e., 1 in 1,000,000) levels to provide perspective on the range of potential cleanup levels derived from the risk assessment. Risk values are typically reported at one significant digit.

The results of the carcinogenic risk calculations indicate that cancer risks are greater than 10^{-5} in the industrial area (ICR = 1.5×10^{-5}). Cancer risks are greater than 10^{-6} (but less than 10^{-5}) in the East Mountain Front, Industrial Area, North Mountain Front and Silver King Wash for all trespassers and workers, except for teens in the North Mountain Front (ICR = 7×10^{-7}).

The results of the noncarcinogenic risk calculations indicate that risks are all at least an order of magnitude less than a hazard quotient of unity in all land use areas for both adults and teens/pre-teens.

4.1 Risk-Based Screening Levels

The RBSLs were calculated to indicate potential cleanup levels for each land use area, to be used as the threshold in the statistical evaluation of data adequacy. The RACs were back-calculated using the same exposure parameters used in the risk calculations for selected risk levels (ICR = 10^{-4}, 10^{-5}, 10^{-6}, HQ = 1), as shown in Tables 4-1 through 4-4. The general RAC calculations are as follows:

Carcinogenic RBSL:

$$\text{Cancer RBSL} = \frac{BW \times ATc \times ICR}{Conc \times Bio \times IR \times FS \times EF \times ED \times CF \times SF}$$

Noncarcinogenic RBSL:

$$\text{Noncancer RBSL} = \frac{BW \times ATnc \times RfD \times HQ}{Conc \times Bio \times IR \times FS \times EF \times ED \times CF}$$

The cancer RBSLs are estimated for arsenic only (Table 4-6), as it is the only carcinogenic COC. The cancer RBSL estimated at each risk level (i.e., ICR 10^{-6} through 10^{-4}) vary by an order of magnitude at each level. For the ease of interpretation, only the lowest midlevel cancer RBSL (ICR = 10^{-5}) for the three receptors are described in this section, and are presented to two significant digits.

- East Mountain Front – The 10-5 cancer RBSL for this area is about 300 mg/kg arsenic, which is lower than the maximum observed arsenic concentration in the EMF of 387 mg/kg.
- Industrial Area – The 10-5 cancer RBSL for this area is about 170 mg/kg arsenic, which is lower than the maximum observed arsenic concentration in the IA of 490 mg/kg.
- North Mountain Front – The 10-5 cancer RBSL for this area is about 600 mg/kg arsenic, which is above the maximum observed arsenic concentration in the NMF of 360 mg/kg.
- Silver King Wash – The 10-5 cancer RBSL for this area is about 300 mg/kg arsenic, which is above the maximum observed arsenic concentrations in the SKW of 127 mg/kg.

The noncancer RBSL for both arsenic and copper are compared to an HQ of unity (Table 2-17). The following points summarize the noncancer RBSL:

- All of the noncancer RBSL for arsenic are at least four times greater than the cancer RBSL for arsenic, indicating that the cancer RBSL will drive any remedial action decisions in all land use areas.
- The noncancer RBSL for copper is about five times the maximum observed copper concentration in the industrial area. The noncancer RBSL for copper in all other land use areas are all several orders of magnitude greater than the maximum observed copper concentrations in each respective area, indicating that remediation will likely not be driven by noncancer RBSL in these areas under the conditions of the preliminary risk assessment.

5.0 ADEQUACY OF THE NUMBER OF EXISTING SAMPLES

This section describes the evaluation of whether there are an adequate number of existing samples for the risk characterizations described in the Site Characterization Report. The usability of the existing datasets with respect to sampling design, sample type, depth interval, particle size fraction, and laboratory quality was discussed in Section 4.1.2 of the Site Characterization Report.

The West Plant Site is separated into four land, or exposure, areas (Figure 1-2 of the Site Characterization Report) for the HHRA. In statistical terms, these exposure areas are known as “strata” (Gilbert 1987), which are not to be confused with the geological usage of the word “strata”. Within the industrial area, RCML has elected to define a “stack zone” bounded by the 500 mg/kg isopleth for arsenic (Figure 3-2 of the Site Characterization Report). This is a minimum zone in which the decision to remediate is inevitable, and no additional data are needed to make the decision or reduce the uncertainty regarding the decision.

The adequacy of the existing number of samples for each stratum (i.e., land area) was evaluated using the algorithms available in Visual Sampling Plan (VSP) Version 6.1, a sampling design package available to the public from Pacific Northwest National Laboratory. The required inputs to VSP are a map of each stratum, the standard deviation of the concentration distribution, the false positive and false negative error rates, the limits of the statistical grey region, and a fixed threshold (i.e., an action level). The standard deviation of surface soil arsenic concentrations was derived from the dataset presented in Table 2-1. Sampling designs used an alpha (false rejection rate) of 5%, a beta (false acceptance rate) of 10%, and a grey region fixed at ½ the action level. The action levels were the RBSLs developed in Section 4 of this report.

VSP also requires that the user choose parametric or nonparametric methods. The dataset was checked for normality, and given that the distributions were not normal, an ordinary sampling design with no distributional assumption was selected (Multi-Agency Radiation Survey and Site Investigation Manual [MARSSIM] method).

The null hypothesis was that the site was contaminated. The median soil arsenic concentration in each stratum was compared to its respective action level. Based on this approach, the optimum number of sample sites for each stratum was calculated in VSP and compared to the number of existing samples. VSP uses an equation based on a sign test to calculate the number of required samples. The required number of samples is calculated such that, if the inputs to the equation are true, the calculated number of samples will cause the null hypothesis to be rejected.

Table 4-8 presents the results of the data adequacy determination. These results indicate that an adequate number of samples have already been collected in all of the land areas in the West Plant Site.

The attached VSP worksheets document the inputs, assumptions, and methods for determining data adequacy.

6.0 REFERENCES

Arizona Department of Health Services (ADHS). 2003. Deterministic Risk Assessment Guidance, Prepared by the ADHS Office of Environmental Health, May 16.

Brown and Caldwell. 1998. Draft Remediation Action Plan, BHP Superior Operations, Prepared for BHP Copper, Superior Operations, Superior, Arizona. November 2, 1998.

Golder Associates Inc. 2007. Work Plan, Human Health Risk Assessment, West Plant Site, Superior, Arizona. Submitted to Resolution Copper Mining LLC, Superior, AZ. Submitted by Golder Associates, Redmond, WA. November 20.

Golder. 2008. Human Health Risk Assessment Report for the West Plant Site, Superior, Arizona. Submitted to Resolution Copper Mining LLC, Superior, AZ. Submitted by Golder Associates, Redmond, WA. July 16.

Golder. 2011. DRAFT: Site Characterization Report for the West Plant Site, Superior, Arizona. Submitted to Resolution Copper Mining LLC, Superior, AZ. Submitted by Golder Associates, Redmond, WA. January 25.

Gradient. 2000. Human Health Risk Assessment, Hurley Soils Investigation Unit. Prepared for the State of New Mexico Environment Department. Prepared by Gradient Corporation, Cambridge, MA. February 22, 2000.

Gilbert, O, Richards. 1987. Statistical Methods for Environmental Pollution Monitoring John Wiley & Sons, Inc.

U.S. Environmental Protection Agency (EPA). 1989. Risk Assessment Guidance for Superfund, Interim Final, OSWER Directive 9285.7-01a, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington DC, September.

EPA. 1991. Human Health Evaluation Manual, Supplemental Guidance, Standard Default Factors, Memorandum, OSWER Directive 9285.6-03, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington DC, March 25.

EPA. 1996a. Soil Screening Guidance: Users Guide, Office of Solid Waste and Emergency Response, Washington, D.C., 9355.4-23 EPA/540/R-96/018 PB96-963505, April.

EPA. 1996b. Final Baseline Human Health Risk Assessment, Anaconda Smelter NPL Site, Anaconda, Montana, Remedial Planning Activities at Selected Uncontrolled Hazardous Substances Disposal Sites in a Zone for EPA Regions VI, VII, and VIII, U.S. EPA Contract No. 68-W9-0021, prepared for U.S. Environmental Protection Agency, prepared by CDM Federal Programs Corporation, Golden, Colorado, January 24.

EPA. 1997. Exposure Factors Handbook, Volume 1, General Factors, EPA/600/P-95/002Fa.: U.S. Environmental Protection Agency, Office of Research and Development, National Center for Environmental Assessment, U.S. EPA, Washington, DC. August 1997.

EPA. 1998. Record of Decision, Community Soils Operable Unit, Anaconda Smelter NPL Site, Anaconda, Montana, U.S. Environmental Protection Agency and Montana Department of Environmental Quality, September.

EPA. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, December, OSWER 9355.4-24. Office of Emergency and Remedial Response, U.S. EPA, Washington, DC. December 2002.

EPA. 2004. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005. OSWER 9285.7-02EP. Office of Superfund and Technology Innovation, U.S. EPA, Washington, DC. July 2004.

EPA. 2008. Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iriswebp/iris, accessed October 7, 2011.

Wyllie, J. 1957. Copper poisoning at a cocktail party. American Journal of Public Health. 47:617.

TABLES

Table 2-1: Datasets Used for VSP Analyses

Sample Dataset	Samples	Arsenic (mg/Kg)
Eastern Mountain Front		
B&C 1998	*10-154*	31
	10-165	130
	10-181	150
	10-205	93
	10-226	22
Golder February 2008	*EMF-07HHRA-001*	39.1
	EMF-07HHRA-002	283
	EMF-07HHRA-003	123
	EMF-07HHRA-004	258
	EMF-07HHRA-005	387
	EMF-07HHRA-006	149
Golder April 2009	*EMF-07HHRA-002N1*	158
	EMF-07HHRA-002S1	225
	EMF-07HHRA-003N1	162
	EMF-07HHRA-003W1	272
	EMF-07HHRA-004N1	211
	EMF-07HHRA-004W1	251
	EMF-07HHRA-005N1	210
	EMF-07HHRA-005E1	291
Eastern Mountain Front Statistics	**Average**	181
	Standard Deviation	97.82
	Median	162
	Coefficient of Variation	0.54
	Maximum	387
	Minimum	22
	Count	19
Industrial Area (Excluding Stack Zone)		
B&C 1998	*10-113*	100
	10-114	68
	10-115	120
	10-116	160
	10-123	120
	10-124	88
	10-125	76
	10-126	2
	10-127	4
	10-134	190
	10-135	10
	10-136	150
	10-138	20
	10-144	88
	10-145	200
	10-146	150
	10-147	330
	10-149	29
	10-155	340
	10-156	81
	10-157	380
	10-158	10
	10-161	49
	10-163	220
	10-164	78
	10-166	51
	10-167	490
	10-179	250
	10-180	56
	10-182	330
	10-183	120
	10-184	20
	10-185	22
	10-186	9

Table 2-1: Datasets Used for VSP Analyses

Sample Dataset	Samples	Arsenic (mg/Kg)
B&C 1998 Cont.	*10-187*	320
	10-189	28
	10-190	12
	10-193	40
	10-194	46
	10-195	360
	10-197	31
	10-204	13
	10-207	70
	10-208	13
	10-210	18
	10-220	150
	10-221	72
	10-223	67
	10-227	72
	10-250	240
	10-251	470
	10-252	280
	10-256	350
	10-266	420
	10-267	420
	10-268	6
	10-270	25
	10-278	57
	10-279	12
	10-282	11
	10-242	460
	10-260	290
	10-261	210
	10-262	44
	10-273	60
	10-274	170
	10-276	95
	10-277	30
	10-283	84
	10-284	33
	10-285	46
	10-286	36
Industrial Area (Excluding Stack Zone) Statistics	**Average**	133
	Standard Deviation	136.26
	Median	74
	Coefficient of Variation	1.03
	Maximum	490
	Minimum	2
	Count	72

Table 2-1: Datasets Used for VSP Analyses

Sample Dataset	Samples	Arsenic (mg/Kg)
Industrial Area (Stack Zone Only)		
B&C 1998	*10-209*	600
	10-248	660
	10-269	730
	10-196	770
	10-192	810
	10-254	840
	10-228	910
	10-191	930
	10-249	960
	10-188	1,000
	10-219	1,000
	10-231	1,000
	10-206	1,100
	10-213	1,300
	10-211	1,400
	10-232	1,400
	10-253	1,400
	10-230	1,500
	10-212	1,700
	10-217	1,800
	10-229	2,200
	10-255	2,200
	10-215	2,300
	10-214	2,400
	10-222	2,500
	10-236	2,500
	10-216	2,800
	10-218	3,500
	10-235	3,500
	10-241	4,000
	10-233	4,500
	10-234	4,500
	10-237	5,100
Industrial Area (Stack Zone Only) Statistics	**Average**	1,934
	Standard Deviation	1259
	Median	1,400
	Coefficient of Variation	0.65
	Maximum	5,100
	Minimum	600
	Count	33
North Mountain Front		
B&C 1998	*10-117*	80
	10-118	120
	10-119	130
	10-120	120
	10-128	200
	10-129	110
	10-130	260
	10-131	70
	10-139	18
	10-140	280
	10-141	300
	10-142	140
	10-143	100
	10-150	6
	10-151	360
	10-152	150
	10-153	280
	10-162	190
	10-109	150
	10-110	79

Table 2-1: Datasets Used for VSP Analyses

Sample Dataset	Samples	Arsenic (mg/Kg)
Golder February 2008	*NMF-07HHRA-001*	45.3
	NMF-07HHRA-002	31.9
	NMF-07HHRA-003	64.3
	NMF-07HHRA-004	87.0
	NMF-07HHRA-005	176
	NMF-07HHRA-006	51.3
	NMF-07HHRA-007	53.1
	NMF-07HHRA-008	37.6
	NMF-07HHRA-009	94.3
	NMF-07HHRA-010	35.9
	NMF-07HHRA-011	32.4
	NMF-07HHRA-012	87.1
	NMF-07HHRA-013	44.0
	NMF-07HHRA-014	69.1
	NMF-07HHRA-015	223
Golder April 2009	*NMF-07HHRA-005E1*	97.4
	NMF-07HHRA-005S1	79.1
North Mountain Front Statistics	**Average**	120
	Standard Deviation	87.9
	Median	94
	Coefficient of Variation	0.73
	Maximum	360
	Minimum	6
	Count	37
Silver King Wash		
B&C 1998	*10-100*	80
	10-111	79
	10-112	110
	10-122	39
	10-133	82
Golder February 2008	*SKW-07HHRA-001*	61.4
	SKW-07HHRA-002	80.6
	SKW-07HHRA-003	55.9
	SKW-07HHRA-004	23.0
	SKW-07HHRA-005	125
	SKW-07HHRA-006	127
Silver King Wash Statistics	**Average**	78
	Standard Deviation	33.1
	Median	80
	Coefficient of Variation	0.42
	Maximum	127
	Minimum	23
	Count	11

Notes:
All results detected, no qualifiers needed.
B&C = Brown and Caldwell
mg/Kg = milligrams per kilogram
VSP = Visual sampling protocol

Table 2-2: Summary Statistics for Soil Concentrations

Land Use Area	Arsenic (mg/kg)									Copper (mg/kg)							
	Number of Samples^	Standard Deviation	Minimum	Maximum	Mean	Median	Distribution Type	95% UCL Equation	95% UCL *	Number of Samples	Minimum	Maximum	Mean	Median	Distribution Type	95% UCL Equation	95% UCL *
East Mountain Front	19	97.82	22	387	181	162	Normal	95% Student's-t UCL	220	19	215	4,800	2,658	3,090	Normal	95% Student's-t UCL	3,195
Industrial Area (excluding Stack Zone)	72	136.26	2	490	133	74	Gamma	95% Approximate Gamma UCL	166	72	75	59,000	3,731	1,550	Lognormal	95% H-UCL	6,030
North Mountain Front	37	87.90	6	360	120	94	Gamma	95% Approximate Gamma UCL	150	37	120	4,400	1,360	920	Gamma	95% Approximate Gamma UCL	1,722
Silver King Wash	11	33.1	23	127	78	80	Normal	95% Student's-t UCL	97	11	184	1,130	782	808	Normal	95% Student's-t UCL	937

NA Not available

* = 95% upper confidence limit based on distribution type (normal, gamma, lognormal, or non-parametric). The 95% UCL was calculated using ProUCL Version 4.00.02. The results of the ProUCL Analysis and equations used in the program are provided in Appendix C.

^ = Does not include field duplicates

BOLD indicates that the sample size may not be adequate enough to compute meaningful and reliable test statistics and estimates.

Table includes data for surface samples only

Non-detect samples were included in calculations at a concentration of one-half the detection limit

Table 2-2: Summary Statistics for Soil Concentrations

Land Use Area	Lead (mg/kg)							
	Number of Samples	Minimum	Maximum	Mean	Median	Distribution Type	95% UCL Equation	95% UCL *
East Mountain Front	14	95	1,780	408	306	Lognormal	95% H-UCL	608
Industrial Area (excluding Stack Zone)	3	207	330	272	280	NA	NA	NA
North Mountain Front	17	56	818	170	119	Lognormal	95% H-UCL	231
Silver King Wash	6	24	116	80	86	Normal	95% Student's-t UCL	**107**

Table 2-3: Summary of Toxicity Factors for Constituents of Concern

Oral Carcinogenicity

Constituent	Oral Slope Factor (kg-d/mg)	Referenced Study	Species Tested	Tumors Observed	Modeling Approach	Source	Weight of Evidence (WOE)	WOE Source	Oral Bioavailability [a]
Arsenic	1.5	Tseng, 1977; Tseng et al., 1968	humans	Skin Cancer	Multistage Model	IRIS	A	IRIS	0.40
Copper	NA	NA	NA	NA	NA	NA	D	IRIS	1.0
Lead	NA	NA	NA	NA	NA	NA	B2	IRIS	1.0

Inhalation Carcinogenicity

Constituent	Inhalation Unit Risk (m^3/ug)	Inhalation Slope Factor (kg-d/mg)	Referenced Study	Species Tested	Tumors Observed	Modeling Approach	Weight of Evidence (WOE)	Source
Arsenic	4.30E-03	15	Brown and Chu, 1983; Lee-Feldstein, 1983; Enterline and Marsh, 1982	Human, male	Lung cancer	Absolute-risk linear model	A	IRIS
Copper	NA	NA	NA	NA	NA	NA	D	IRIS
Lead	NA	NA	NA	NA	NA	NA	B2	IRIS

Oral Toxicity

Constituent	Chronic Oral RfD (mg/kg-d)	Referenced Study	Species Tested	Observed Health Effects	NOAEL (mg/kg-d)	LOAEL (mg/kg-d)	Uncertainty Factors	Comments	Source
Arsenic	3.0E-04	Tseng, 1977; Tseng et al., 1968	Humans	Hyperpigmentation, keratosis and possible vascular complications	0.0008 (0.009 mg/L)	0.014 (0.17 mg/L)	3	NA	IRIS
Copper	4.0E-02	Wylie, 1957	Humans	Gastrointestinal effects	NA	0.07 (5.3 mg/L)	2	based on MCLG (1.3 mg/L)	a
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA

a See Section 2.5.2 for derivation of acceptable exposure level for copper

Inhalation Toxicity

Constituent	Chronic Inhalation RfC (mg/m^3)	Chronic Inhalation RfD (mg/kg-d)	Referenced Study	Species Tested	Observed Health Effects	NOAEL (mg/m^3)	LOAEL (mg/m^3)	Uncertainty Factors	Source
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	IRIS
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	IRIS

Dermal Toxicity and Carcinogenicity

Constituent	Dermal Absorption Value (%)	Oral RfD (mg/kg-d)	Oral Slope Factor (kg-d/mg)	Dermal RfD (mg/kg-d)	Dermal Slope Factor (kg-d/mg)
Arsenic	1%	3.00E-04	1.5	3.00E-04	1.5
Copper	3%	0.04	NA	0.04	NA
Lead	3%	NA	NA	NA	NA

a Bioavailability value for arsenic based on value used at Northwest Study Area. 100% bioavailability is assumed as default for copper and lead.

Table 3-1: Reasonable Maximum Exposure Assumptions for the Industrial Area Adult Worker

Site:	Industrial Area
Receptor:	Adult Worker
Age:	>18 years old

Exposure Route	Parameter Code	Parameter Definition	Units	Reasonable Maximum Value	Reference	RME Rationale
Ingestion	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF soil	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	219	EPA 2004	
	FI	Fraction Ingested	unitless	1.0		Not evaluated
	FS	Fraction Soil	unitless	0.65	SS	65% of the area contains contaminated soil
	IR_{soil}	Ingestion Rate-Soil	mg/day	50	ADHS 2003	
Inhalation	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	ED	Exposure Duration	yr	25.0	ADHS 2003	
	EF	Exposure Frequency	day/yr	219	EPA 2004	
	1/PEF	1/Particulate Emission Factor	m^3/kg	1.397E+09	ADHS 2003	calculated as 1 / (7.16E-10)
	IR_{air}	Inhalation Rate	m^3/day	20	ADHS 2003	
Dermal	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	219	EPA 2004	
	SA	Skin Surface Area	cm^2/day	2,127	EPA 2004	Worker wearing long-sleeved shirt
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.2	ADHS 2003	

SS - Site specific value based on professional judgment
ADHS 2003. Arizona Department of Health Services Deterministic Risk Assessment Guidance
EPA 2004. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

Table 3-2: Reasonable Maximum Exposure Assumptions for the Industrial Area Teen Trespasser

Site:	Industrial Area
Receptor:	Teen Trespasser
Age:	13 to 18 Years Old

Exposure Route	Parameter Code	Parameter Definition	Units	Reasonable Maximum Value	Reference	RME Rationale
Ingestion	BW	Body Weight	kg	59	EPA 1997a	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	1,825	ADHS 2003	
	CF soil	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	5	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	FI	Fraction Ingested	unitless	0.5	SS	50% of the day is spent onsite.
	FS	Fraction Soil	unitless	0.65	SS	65% of the area contains contaminated soil
	IR_{soil}	Ingestion Rate	mg/day	100	EPA 2002a	
Inhalation	BW	Body Weight	kg	59	EPA 1997a	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	1,825	ADHS 2003	
	ED	Exposure Duration	yr	5	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	1/PEF	1/Particulate Emission Factor	m^3/kg	1.397E+09	ADHS 2003	calculated as 1 / (7.16E-10)
	IR_{air}	Inhalation Rate	m^3/day	15	ADHS 2003	
Dermal	BW	Body Weight	kg	59	EPA 1997a	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	1,825	ADHS 2003	
	CF	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	5	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	SA	Skin Surface Area	cm^2/day	6,700	EPA 2004	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.04	EPA 2004	Children playing in dry soil.

SS - Site specific value based on professional judgment

ADHS 2003. Arizona Department of Health Services Deterministic Risk Assessment Guidance
EPA 1997a. Exposure Factors Handbook, Volume 1, General Factors
EPA 2002a. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites
EPA 2004. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

Table 3-3: Reasonable Maximum Exposure Assumptions for the Industrial Area Adult Trespasser

Site:	Industrial Area
Receptor:	Adult Trespasser
Age:	> 18 years old

Exposure Route	Parameter Code	Parameter Definition	Units	Reasonable Maximum Value	Reference	RME Rationale
Ingestion	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF soil	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	FI	Fraction Ingested	unitless	0.5	SS	50% of the day is spent onsite.
	FS	Fraction Soil	unitless	0.65	SS	65% of the area contains contaminated soil
	IR_{soil}	Ingestion Rate	mg/day	100	ADHS 2003	
Inhalation	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	1/PEF	1/Particulate Emission Factor	m^3/kg	1.397E+09	ADHS 2003	calculated as 1 / (7.16E-10)
	IR_{air}	Inhalation Rate	m^3/day	20	ADHS 2003	
Dermal	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	SA	Skin Surface Area	cm^2/day	5,700	EPA 2004	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.01	EPA 2004	Adult landscaper

SS - Site specific value based on professional judgment

ADHS 2003. Arizona Department of Health Services Deterministic Risk Assessment Guidance

EPA 2002a. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites

EPA 2004. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

Table 3-4: Reasonable Maximum Exposure Assumptions for the East Mountain Front Adult Worker

Site:	East Mountain Front
Receptor:	Adult Industrial Worker
Age:	> 18 years old

Exposure Route	Parameter Code	Parameter Definition	Units	Reasonable Maximum Value	Reference	RME Rationale
Ingestion	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF soil	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	FI	Fraction Ingested	unitless	1.00	SS	
	IR_{soil}	Ingestion Rate	mg/day	50	ADHS 2003	
Inhalation	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	1/PEF	1/Particulate Emission Factor	m^3/kg	1.397E+09	ADHS 2003	calculated as 1 / (7.16E-10)
	IR_{air}	Inhalation Rate	m^3/day	20	ADHS 2003	
Dermal	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	SA	Skin Surface Area	cm^2/day	2,127	EPA 2004	Worker wearing long-sleeved shirt
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.2	ADHS 2003	

SS - Site specific value based on professional judgment

ADHS 2003. Arizona Department of Health Services Deterministic Risk Assessment Guidance

EPA 2004. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

Table 3-5: Reasonable Maximum Exposure Assumptions for the East Mountain Front Teen Trespasser

Site:	East Mountain Front
Receptor:	Teen Trespasser
Age:	13 to 18 Years Old

Exposure Route	Parameter Code	Parameter Definition	Units	Reasonable Maximum Value	Reference	RME Rationale
Ingestion	BW	Body Weight	kg	59	EPA 1997a	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	1,825	ADHS 2003	
	CF soil	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	5	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	FI	Fraction Ingested	unitless	0.5	SS	50% of the day is spent onsite.
	IR_{soil}	Ingestion Rate	mg/day	100	ADHS 2003	
Inhalation	BW	Body Weight	kg	59	EPA 1997a	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	1,825	ADHS 2003	
	ED	Exposure Duration	yr	5	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	1/PEF	1/Particulate Emission Factor	m^3/kg	1.397E+09	ADHS 2003	calculated as 1 / (7.16E-10)
	IR_{air}	Inhalation Rate	$m^{3/}day$	15	EPA 1991	
Dermal	BW	Body Weight	kg	59	EPA 1997a	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	1,825	ADHS 2003	
	CF	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	5	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	SA	Skin Surface Area	cm^2/day	6,700	EPA 2004	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.04	EPA 2004	Children playing in dry soil.

SS - Site specific value based on professional judgment

ADHS 2003. Arizona Department of Health Services Deterministic Risk Assessment Guidance
EPA 1991. Risk Assessment Guidance for Superfund Vol 1: Human Health Evaluation Manual (Part A), Supplemental Guidance, "Standard Default Exposure Factors"
EPA 2004. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

Table 3-6: Reasonable Maximum Exposure Assumptions for the East Mountain Front Adult Trespasser

Reasonable	East Mountain Front
Receptor:	Adult Trespasser
Age:	> 18 Years Old

Exposure Route	Parameter Code	Parameter Definition	Units	Reasonable Maximum Value	Reference	RME Rationale
Ingestion	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF soil	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	FI	Fraction Ingested	unitless	0.5	SS	50% of the day is spent onsite.
	IR_{soil}	Ingestion Rate	mg/day	100	ADHS 2003	
Inhalation	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	1/PEF	1/Particulate Emission Factor	m^3/kg	1.397E+09	ADHS 2003	calculated as 1 / (7.16E-10)
	IR_{air}	Inhalation Rate	m^3/day	20	ADHS 2003	
Dermal	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	SA	Skin Surface Area	cm^2/day	5,700	EPA 2004	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.01	EPA 2004	Adult soccer player

SS - Site specific value based on professional judgment

ADHS 2003. Arizona Department of Health Services Deterministic Risk Assessment Guidance

EPA 2004. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

Table3-7: Reasonable Maximum Exposure Assumptions for the East Mountain Front Teen Trespasser

Site:	North Mountain Front
Receptor:	Adult Worker
Age:	>18 years old

Exposure Route	Parameter Code	Parameter Definition	Units	Reasonable Maximum Value	Reference	RME Rationale
Ingestion	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF soil	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	40	SS	Approximately once per week (minus two hot summer months)
	FI	Fraction Ingested	unitless	1.0		Not evaluated
	IR_{soil}	Ingestion Rate-Soil	mg/day	50	ADHS 2003	
Inhalation	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	ED	Exposure Duration	yr	25.0	ADHS 2003	
	EF	Exposure Frequency	day/yr	40	SS	
	1/PEF	1/Particulate Emission Factor	m^3/kg	1.397E+09	ADHS 2003	calculated as 1 / (7.16E-10)
	IR_{air}	Inhalation Rate	m^3/day	20	ADHS 2003	
Dermal	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	40	SS	
	SA	Skin Surface Area	cm^2/day	2,127	EPA 2004	Worker wearing long-sleeved shirt
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.2	ADHS 2003	

SS - Site specific value based on professional judgment

ADHS 2003. Arizona Department of Health Services Deterministic Risk Assessment Guidance

EPA 2004. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

Table 3-8: Reasonable Maximum Exposure Assumptions for the North Mountain Front Adult Worker

Site:	North Mountain Front
Receptor:	Teen Trespasser
Age:	13 to 18 years old

Exposure Route	Parameter Code	Parameter Definition	Units	Reasonable Maximum Value	Reference	RME Rationale
Ingestion	BW	Body Weight	kg	59	EPA 1997a	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	1,825	ADHS 2003	
	CF soil	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	5	ADHS 2003	
	EF	Exposure Frequency	day/yr	40	SS	Approximately once per week (minus two hot summer months)
	FI	Fraction Ingested	unitless	0.5	SS	50% of the day is spent onsite.
	IR_{soil}	Ingestion Rate	mg/day	100	EPA 2002a	
Inhalation	BW	Body Weight	kg	59	EPA 1997a	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	1,825	ADHS 2003	
	ED	Exposure Duration	yr	5	ADHS 2003	
	EF	Exposure Frequency	day/yr	40	SS	Approximately once per week (minus two hot summer months)
	1/PEF	1/Particulate Emission Factor	m^3/kg	1.397E+09	ADHS 2003	calculated as 1 / (7.16E-10)
	IR_{air}	Inhalation Rate	m^3/workday	15	ADHS 2003	
Dermal	BW	Body Weight	kg	59	EPA 1997a	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	1,825	ADHS 2003	
	CF	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	5	ADHS 2003	
	EF	Exposure Frequency	day/yr	40	SS	Approximately once per week (minus two hot summer months)
	SA	Skin Surface Area	cm^2/day	6,700	EPA 2004	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.04	EPA 2004	Children playing in dry soil.

SS - Site specific value based on professional judgment

ADHS 2003. Arizona Department of Health Services Deterministic Risk Assessment Guidance

EPA 1997a. Exposure Factors Handbook, Volume 1, General Factors

EPA 2002a. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites

EPA 2004. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

Table 3-9: Reasonable Maximum Exposure Assumptions for the North Mountain Front Adult Trespasser

Site:	North Mountain Front
Receptor:	Adult Trespasser
Age:	> 18 years old

Exposure Route	Parameter Code	Parameter Definition	Units	Reasonable Maximum Value	Reference	RME Rationale
Ingestion	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF soil	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	40	SS	Approximately once per week (minus two hot summer months)
	FI	Fraction Ingested	unitless	0.5	SS	50% of the day is spent onsite.
	IR_{soil}	Ingestion Rate	mg/day	100	ADHS 2003	
Inhalation	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	40	SS	Approximately once per week (minus two hot summer months)
	1/PEF	1/Particulate Emission Factor	m^3/kg	1.397E+09	ADHS 2003	calculated as 1 / (7.16E-10)
	IR_{air}	Inhalation Rate	$m^3/workday$	20	ADHS 2003	
Dermal	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	40	SS	Approximately once per week (minus two hot summer months)
	SA	Skin Surface Area	cm^2/day	5,700	EPA 2004	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.01	EPA 2004	Adult landscaper

SS - Site specific value based on professional judgment
ADHS 2003. Arizona Department of Health Services Deterministic Risk Assessment Guidance
EPA 2004. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

Table 3-10: Reasonable Maximum Exposure Assumptions for the Silver King Wash Adult Worker

Site:	Silver King Wash
Receptor:	Adult Worker
Age:	>18 years old

Exposure Route	Parameter Code	Parameter Definition	Units	Reasonable Maximum Value	Reference	RME Rationale
Ingestion	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF soil	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	FI	Fraction Ingested	unitless	1.0		Not evaluated
	IR_{soil}	Ingestion Rate-Soil	mg/day	50	ADHS 2003	
Inhalation	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	ED	Exposure Duration	yr	25.0	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	1/PEF	1/Particulate Emission Factor	m^3/kg	1.397E+09	ADHS 2003	calculated as 1 / (7.16E-10)
	IR_{air}	Inhalation Rate	m^3/day	20	ADHS 2003	
Dermal	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	SA	Skin Surface Area	cm^2/day	2,127	EPA 2004	Worker wearing long-sleeved shirt
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.2	ADHS 2003	

SS - Site specific value based on professional judgment

ADHS 2003. Arizona Department of Health Services Deterministic Risk Assessment Guidance

EPA 2004. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

Table 3-11: Reasonable Maximum Exposure Assumptions for the Silver King Wash Preteen Trespasser

Site:	Silver King Wash
Receptor:	Preteen Trespasser
Age:	6 to 13 Years Old

Exposure Route	Parameter Code	Parameter Definition	Units	Reasonable Maximum Value	Reference	RME Rationale
Ingestion	BW	Body Weight	kg	35	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	2,555	ADHS 2003	
	CF soil	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	7	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	FI	Fraction Ingested	unitless	0.5	SS	50% of the day is spent onsite.
	IR_{soil}	Ingestion Rate	mg/day	100	ADHS 2003	
Inhalation	BW	Body Weight	kg	35	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	2,555	ADHS 2003	
	ED	Exposure Duration	yr	7	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	1/PEF	1/Particulate Emission Factor	m^3/kg	1.397E+09	ADHS 2003	calculated as 1 / (7.16E-10)
	IR_{air}	Inhalation Rate	m^3/day	15	EPA 1991	
Dermal	BW	Body Weight	kg	35	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	2,555	ADHS 2003	
	CF	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	7	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	SA	Skin Surface Area	cm^2/day	4,421	EPA 2004	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.04	EPA 2004	Children playing in dry soil.

SS - Site specific value based on professional judgment

ADHS 2003. Arizona Department of Health Services Deterministic Risk Assessment Guidance

EPA 1991. Risk Assessment Guidance for Superfund Vol 1: Human Health Evaluation Manual (Part A), Supplemental Guidance, "Standard Default Exposure Factors"

EPA 2004. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

Table 3-12: Reasonable Maximum Exposure Assumptions for the Silver King Wash Adult Trespasser

Site:	Silver King Wash
Receptor:	Adult Trespasser
Age:	> 18 years old

Exposure Route	Parameter Code	Parameter Definition	Units	Reasonable Maximum Value	Reference	RME Rationale
Ingestion	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF soil	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	FI	Fraction Ingested	unitless	0.5	SS	50% of the day is spent onsite.
	IR_{soil}	Ingestion Rate-Soil	mg/day	100	ADHS 2003	
Inhalation	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	60	SS	Approximately twice per week (minus two hot summer months)
	1/PEF	1/Particulate Emission Factor	m^3/kg	1.397E+09	ADHS 2003	calculated as 1 / (7.16E-10)
	IHR	Inhalation Rate	m^3/workday	20	ADHS 2003	
Dermal	BW	Body Weight	kg	70	ADHS 2003	
	ATc	Averaging Time Carcinogen	days	25,550	ADHS 2003	
	ATnc	Averaging Time Noncarcinogen	days	9,125	ADHS 2003	
	CF	Conversion Factor	kg/mg	1.0E-06		
	ED	Exposure Duration	yr	25	ADHS 2003	
	EF	Exposure Frequency	day/yr	80	SS	Approximately twice per week (minus two hot summer months)
	SA	Skin Surface Area	cm^2/day	5,700	EPA 2004	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.01	EPA 2004	Adult landscaper

SS - Site specific value based on professional judgment

ADHS 2003. Arizona Department of Health Services Deterministic Risk Assessment Guidance

EPA 2004. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

Table 4-1: Reasonable Maximum Exposure Risk Characterization for the East Mountain Front

EAST MOUNTAIN FRONT														
			Teen Trespasser (13-18 years)				Adult Trespasser (> 18 years)				Adult Worker (> 18 years)			
Parameter	**Code**	**Units**	**Arsenic**	**Copper**	**Lead***	**Total**	**Arsenic**	**Copper**	**Lead***	**Total**	**Arsenic**	**Copper**	**Lead***	**Total**
INCIDENTAL SOIL INGESTION														
Soil Concentration	Conc soil	mg/kg	220	3195	608	NA	220	3195	608	NA	220	3195	608	NA
Bioavailability	Bio	unitless	0.4	1.0	1.0	NA	0.4	1.0	1.0	NA	0.4	1.0	1.0	NA
Conversion Factor	CF	kg/mg	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA
Ingestion Rate	IR Soil	mg/day	100	100	100	NA	100	100	100	NA	50	50	50	NA
Fraction Ingested	FI	-	0.5	0.5	0.5	NA	0.5	0.5	0.5	NA	1.00	1.00	1.00	NA
Exposure Frequency	EF	day/year	80	80	80	NA	80	80	80	NA	80	80	80	NA
Exposure Duration	ED	year	5	5	5	NA	25	25	25	NA	25	25	25	NA
Body Weight	BW	kg	59	59	59	NA	70	70	70	NA	70	70	70	NA
Averaging Time, Cancer	ATc	day	25550	25,550	25,550	NA	25,550	25,550	25,550	NA	25,550	25,550	25,550	NA
Averaging Time, Noncancer	ATnc	day	1825	1,825	1,825	NA	9,125	9,125	9,125	NA	9,125	9,125	9,125	NA
CHRONIC DAILY INTAKES - INGESTION														
Chronic Daily Intake Cancer	CDI C Ing	mg/kg-day	1.2E-06	4.2E-05	8.1E-06	5.2E-05	4.9E-06	1.8E-04	3.4E-05	2.2E-04	4.9E-06	1.8E-04	3.4E-05	2.2E-04
Chronic Daily Intake Noncancer	CDI NC Ing	mg/kg-day	1.6E-05	5.9E-04	1.1E-04	7.2E-04	1.4E-05	5.0E-04	9.5E-05	6.1E-04	1.4E-05	5.0E-04	9.5E-05	6.1E-04
TOXICITY VALUES - INGESTION														
Slope Factor	SF	$(mg/kg\text{-}d)^{-1}$	1.5	NA	NA	NA	1.5	NA	NA	NA	1.5	NA	NA	NA
Reference Dose	RfD	mg/kg-d	3.0E-04	4.0E-02	NA	NA	3.0E-04	4.0E-02	NA	NA	3.0E-04	4.0E-02	NA	NA
RISK ESTIMATES - INGESTION														
Cancer Risk	$ELCR_{Ingestion}$	unitless	1.8E-06	NA	NA	1.8E-06	7.4E-06	NA	NA	7.4E-06	7.4E-06	NA	NA	7.4E-06
Noncancer Risk	$HQ_{Ingestion}$	unitless	0.05	0.01	NA	0.07	0.046	0.013	NA	0.058	0.046	0.013	NA	0.058
SOIL INHALATION														
Soil Concentration	Conc soil	mg/kg	220	3195	608	NA	220	3195	608	NA	220	3195	608	NA
Particulate Emission Factor	1/PEF	m^3/kg	1.397E+09	1.397E+09	1.397E+09	NA	1.397E+09	1.397E+09	1.397E+09	NA	1.397E+09	1.397E+09	1.397E+09	NA
Inhalation Rate	IHR	m^3/day	15	15	15	NA	20	20	20	NA	20	20	20	NA
Exposure Frequency	EF	day/year	80	80	80	NA	80	80	80	NA	80	80	80	NA
Exposure Duration	ED	year	5	5	5	NA	25	25	25	NA	25	25	25	NA
Body Weight	BW	kg	59	59	59	NA	70	70	70	NA	70	70	70	NA
Averaging Time, Cancer	ATc	day	25550	25550	25550	NA	25550	25550	25550	NA	25550	25550	25550	NA
Averaging Time, Noncancer	ATnc	day	1825	1825	1825	NA	9125	9125	9125	NA	9125	9125	9125	NA
CHRONIC DAILY INTAKES - INHALATION														
Chronic Daily Intake Cancer	CDI C Inh	mg/kg-day	6.3E-10	9.1E-09	1.7E-09	1.1E-08	3.5E-09	5.1E-08	9.7E-09	6.4E-08	3.5E-09	5.1E-08	9.7E-09	6.4E-08
Chronic Daily Intake Noncancer	CDI NC Inh	mg/kg-day	8.8E-09	1.3E-07	2.4E-08	1.6E-07	9.9E-09	1.4E-07	2.7E-08	1.8E-07	9.9E-09	1.4E-07	2.7E-08	1.8E-07
TOXICITY VALUES - INHALATION														
Slope Factor	SF	$(mg/kg\text{-}d)^{-1}$	15	NA	NA	NA	15	NA	NA	NA	15	NA	NA	NA
Reference Dose	RfD	mg/kg-d	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RISK ESTIMATES - INHALATION														
Cancer Risk	$ELCR_{Inhalation}$	unitless	9.4E-09	NA	NA	9.4E-09	5.3E-08	NA	NA	5.3E-08	5.3E-08	NA	NA	5.3E-08
Noncancer Risk	$HQ_{Inhalation}$	unitless	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DERMAL CONTACT														
Soil Concentration	Conc soil	mg/kg	220	3195	608	NA	220	3195	608	NA	220	3195	608	NA
Conversion Factor	CF	kg/mg	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA
Skin Surface Area	SA	cm^2	6700	6700	6700	NA	5700	5700	5700	NA	2127	2127	2127	NA
Soil to Skin Adherence Factor	AF	mg/cm^2	0.04	0.04	0.04	NA	0.01	0.01	0.01	NA	0.20	0.20	0.20	NA
Absorption Value	ABS	%	0.01	0.03	0.03	NA	0.01	0.03	0.03	NA	0.01	1.50	1.50	NA
Exposure Frequency	EF	day/year	80	80	80	NA	80	80	80	NA	80	80	80	NA
Exposure Duration	ED	year	5	5	5	NA	25	25	25	NA	25	25	25	NA
Body Weight	BW	kg	59	59	59	NA	70	70	70	NA	70	70	70	NA
Averaging Time, Cancer	ATc	day	25550	25550	25550	NA	25550	25550	25550	NA	25550	25550	25550	NA
Averaging Time, Noncancer	ATnc	day	1825	1825	1825	NA	9125	9125	9125	NA	9125	9125	9125	NA
CHRONIC DAILY INTAKES - DERMAL														
Chronic Daily Intake Cancer	CDI C Der	mg/kg-day	1.6E-07	6.8E-06	1.3E-06	8.3E-06	1.4E-07	6.1E-06	1.2E-06	7.4E-06	1.0E-06	2.3E-03	4.3E-04	2.7E-03
Chronic Daily Intake Noncancer	CDI NC Der	mg/kg-day	2.2E-06	9.5E-05	1.8E-05	1.2E-04	3.9E-07	1.7E-05	3.3E-06	2.1E-05	2.9E-06	6.4E-03	1.2E-03	7.6E-03
TOXICITY VALUES - DERMAL														
Slope Factor	SF	kg-d/mg	1.5	NA	NA	NA	1.5	NA	NA	NA	1.5	NA	NA	NA
Reference Dose	RfD	mg/kg-d	0.0003	0.04	NA	NA	0.0003	0.04	NA	NA	0.0003	0.04	NA	NA
RISK ESTIMATES - DERMAL														
Cancer Risk	$ELCR_{Dermal}$	unitless	2.3E-07	NA	NA	2.3E-07	2.1E-07	NA	NA	2.1E-07	1.6E-06	NA	NA	1.6E-06
Noncancer Risk	HQ_{Dermal}	unitless	0.0073	0.0024	NA	0.010	0.0013	0.00043	NA	0.0017	0.0098	0.15959	NA	0.1694
RISK ESTIMATES - TOTAL														
Cancer Risk	ICR	unitless	2E-06	NA	NA	2E-06	8E-06	NA	NA	8E-06	9E-06	NA	NA	9E-06
Noncancer Risk	HQ	unitless	0.1	0.0	NA	0.1	0.05	0.01	NA	0.06	0.06	0.1720923	NA	0.23

95% UCL: 95% upper confidence limit based on distribution type (normal, gamma, lognormal, or non-parametric).

* The sample size may not be adequate enough to compute meaningful and reliable test statistics and estimates.

1E-06	Excess Lifetime Cancer Risk (ELCR) greater than 10^{-6}
1E-05	Excess Lifetime Cancer Risk (ELCR) greater than 10^{-5}
1	Noncancer Hazard Quotient (HQ) greater than 1

Table 4-2: Reasonable Maximum Exposure Risk Characterization for the Industrial Area

INDUSTRIAL AREA														
			Teen Trespasser (6-13 years)				Adult Trespasser (> 18 years)				Adult Worker (> 18 years)			
Parameter	**Code**	**Units**	**Arsenic**	**Copper**	**Lead***	**Total**	**Arsenic**	**Copper**	**Lead***	**Total**	**Arsenic**	**Copper**	**Lead***	**Total**
INCIDENTAL SOIL INGESTION														
Soil Concentration	Conc soil	mg/kg	166	6030	330	NA	166	6030	330	NA	166	6030	330	NA
Bioavailability	Bio	unitless	0.4	1.0	1.0	NA	0.4	1.0	1.0	NA	0.4	1.0	1.0	NA
Conversion Factor	CF	kg/mg	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA
Ingestion Rate	IR Soil	mg/day	100	100	100	NA	100	100	100	NA	50	50	50	NA
Fraction Soil	FS	-	0.65	0.65	0.65	NA	0.65	0.65	0.65	NA	0.65	0.65	0.65	NA
Fraction Ingested	FI	-	0.5	0.5	0.5	NA	0.5	0.5	0.5	NA	1.0	1.0	1.0	NA
Exposure Frequency	EF	day/year	80	80	80	NA	80	80	80	NA	219	219	219	NA
Exposure Duration	ED	years	5	5	5	NA	25	25	25	NA	25	25	25	NA
Body Weight	BW	kg	59	59	59	NA	70	70	70	NA	70	70	70	NA
Averaging Time, Cancer	ATc	day	25,550	25,550	25,550	NA	25,550	25,550	25,550	NA	25,550	25,550	25,550	NA
Averaging Time, Noncancer	ATnc	day	1,825	1,825	1,825	NA	9,125	9,125	9,125	NA	9,125	9,125	9,125	NA
CHRONIC DAILY INTAKES - INGESTION														
Chronic Daily Intake Cancer	CDI C Ing	mg/kg-day	5.7E-07	5.2E-05	2.8E-06	5.5E-05	2.4E-06	2.2E-04	1.2E-05	2.3E-04	6.6E-06	6.0E-04	3.3E-05	6.4E-04
Chronic Daily Intake Noncance	CDI NC Ing	mg/kg-day	8.0E-06	7.3E-04	4.0E-05	7.8E-04	6.7E-06	6.1E-04	3.4E-05	6.5E-04	1.8E-05	1.7E-03	9.2E-05	1.8E-03
TOXICITY VALUES - INGESTION														
Slope Factor	SF	$(mg/kg\text{-}d)^{-1}$	1.5	NA	NA	NA	1.5	NA	NA	NA	1.5	NA	NA	NA
Reference Dose	RfD	mg/kg-d	3.00E-04	4.00E-02	NA	NA	3.00E-04	4.00E-02	NA	NA	3.00E-04	4.00E-02	NA	NA
RISK ESTIMATES - INGESTION														
Cancer Risk	$ELCR_{Ingestion}$	unitless	8.6E-07	NA	NA	8.6E-07	3.6E-06	NA	NA	3.6E-06	9.9E-06	NA	NA	9.9E-06
Noncancer Risk	$HQ_{Ingestion}$	unitless	0.03	0.018	NA	0.04	0.02	0.015	NA	0.038	0.06	0.042	NA	0.104
SOIL INHALATION														
Soil Concentration	Conc soil	mg/kg	166	6030	330	NA	166	6030	330	NA	166	6030	330	NA
Particulate Emission Factor	1/PEF	m^3/kg	1.397E+09	1.397E+09	1.397E+09	NA	1.397E+09	1.397E+09	1.397E+09	NA	1.397E+09	1.397E+09	1.397E+09	NA
Inhalation Rate	IHR	m^3/day	15	15	15	NA	20	20	20	NA	20	20	20	NA
Exposure Frequency	EF	day/year	80	80	80	NA	80	80	80	NA	219	219	219	NA
Exposure Duration	ED	years	5	5	5	NA	25	25	25	NA	25	25	25	NA
Body Weight	BW	kg	59	59	59	NA	70	70	70	NA	70	70	70	NA
Averaging Time, Cancer	ATc	day	25550	25550	25550	NA	25550	25550	25550	NA	25550	25550	25550	NA
Averaging Time, Noncancer	ATnc	day	1825	1825	1825	NA	9125	9125	9125	NA	9125	9125	9125	NA
CHRONIC DAILY INTAKES - INHALATION														
Chronic Daily Intake Cancer	CDI C Inh	mg/kg-day	4.7E-10	1.7E-08	9.4E-10	1.9E-08	2.7E-09	9.7E-08	5.3E-09	1.0E-07	7.3E-09	2.6E-07	1.4E-08	2.9E-07
Chronic Daily Intake Noncance	CDI NC Inh	mg/kg-day	6.6E-09	2.4E-07	1.3E-08	2.6E-07	7.4E-09	2.7E-07	1.5E-08	2.9E-07	2.0E-08	7.4E-07	4.1E-08	8.0E-07
TOXICITY VALUES - INHALATION														
Slope Factor	SF	$(mg/kg\text{-}d)^{-1}$	15	NA	NA	NA	15	NA	NA	NA	15	NA	NA	NA
Reference Dose	RfD	mg/kg-d	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RISK ESTIMATES - INHALATION														
Cancer Risk	$ELCR_{Inhalation}$	unitless	7.1E-09	NA	NA	7.1E-09	4.0E-08	NA	NA	4.0E-08	1.1E-07	NA	NA	1.1E-07
Dermal Absorption Value	$HQ_{Inhalation}$	unitless	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DERMAL CONTACT														
Soil Concentration	Conc soil	mg/kg	166	6030	330	NA	166	6030	330	NA	166	6030	330	NA
Conversion Factor	CF	kg/mg	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA
Skin Surface Area	SA	cm^2	6700	6700	6700	NA	5700	5700	5700	NA	2127	2127	2127	NA
Soil to Skin Adherence Factor	AF	mg/cm^2	0.04	0.04	0.04	NA	0.01	0.01	0.01	NA	0.20	0.20	0.20	NA
Absorption Value	ABS	%	0.01	0.03	0.03	NA	0.01	0.03	0.03	NA	0.01	0.03	0.03	NA
Exposure Frequency	EF	day/year	80	80	80	NA	80	80	80	NA	219	219	219	NA
Exposure Duration	ED	years	5	5	5	NA	25	25	25	NA	25	25	25	NA
Body Weight	BW	kg	59	59	59	NA	70	70	70	NA	70	70	70	NA
Averaging Time, Cancer	ATc	day	25550	25550	25550	NA	25550	25550	25550	NA	25550	25550	25550	NA
Averaging Time, Noncancer	ATnc	day	1825	1825	1825	NA	9125	9125	9125	NA	9125	9125	9125	NA
CHRONIC DAILY INTAKES - DERMAL														
Chronic Daily Intake Cancer	CDI C Der	mg/kg-day	1.2E-07	1.3E-05	7.0E-07	1.4E-05	1.1E-07	1.2E-05	6.3E-07	1.2E-05	2.2E-06	2.4E-04	1.3E-05	2.5E-04
Chronic Daily Intake Noncance	CDI NC Der	mg/kg-day	1.6E-06	1.8E-04	9.9E-06	1.9E-04	3.0E-07	3.2E-05	1.8E-06	3.4E-05	6.0E-06	6.6E-04	3.6E-05	7.0E-04
TOXICITY VALUES - DERMAL														
Slope Factor	SF	$(mg/kg\text{-}d)^{-1}$	1.5	NA	NA	NA	1.5	NA	NA	NA	1.5	NA	NA	NA
Reference Dose	RfD	mg/kg-d	0.0003	0.04	NA	NA	0.0003	0.04	NA	NA	0.0003	0.04	NA	NA
RISK ESTIMATES - DERMAL														
Cancer Risk	$ELCR_{Dermal}$	unitless	1.8E-07	NA	NA	1.8E-07	1.6E-07	NA	NA	1.6E-07	3.2E-06	NA	NA	3.2E-06
Noncancer Risk	HQ_{Dermal}	unitless	0.0055	0.0045	NA	0.010	0.0010	0.0008	NA	0.0018	0.020	0.0165	NA	0.037
RISK ESTIMATES - TOTAL														
Cancer Risk	ICR	unitless	1E-06	NA	NA	1E-06	4E-06	NA	NA	4E-06	1E-05	NA	NA	1E-05
Noncancer Risk	HQ	unitless	0.03	0.023	NA	0.05	0.02	0.016	NA	0.04	0.08	0.06	NA	0.14

95% UCL: 95% upper confidence limit based on distribution type (normal, gamma, lognormal, or non-parametric).

* Lead exposure concentration represents the maximum observed value. There are insufficient data to calculate 95% UCL.

1E-06	Excess Lifetime Cancer Risk (ELCR) greater than 10^{-6}
1E-05	Excess Lifetime Cancer Risk (ELCR) greater than 10^{-5}
1	Noncancer Hazard Quotient (HQ) greater than 1

95% UCL: 95% upper confidence limit based on distribution type (normal, gamma, lognormal, or non-parametric).

* Lead exposure concentration represents the maximum observed value. There are insufficient data to calculate 95% UCL.

1E-06
1E-05
1

Table 4-3: Reasonable Maximum Exposure Risk Characterization for the North Mountain Front

NORTH MOUNTAIN FRONT														
			Teen Trespasser (13-18 years)				Adult Trespasser (> 18 years)				Adult Worker (> 18 years)			
Parameter	**Code**	**Units**	**Arsenic**	**Copper**	**Lead**	**Total**	**Arsenic**	**Copper**	**Lead**	**Total**	**Arsenic**	**Copper**	**Lead**	**Total**
INCIDENTAL SOIL INGESTION														
Soil Concentration	Conc soil	mg/kg	150	1722	231	NA	150	1722	231	NA	150	1722	231	NA
Bioavailability	Bio	unitless	0.4	1.0	1.0	NA	0.4	1.0	1.0	NA	0.4	1.0	1.0	NA
Conversion Factor	CF	kg/mg	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA
Ingestion Rate	IR Soil	mg/day	100	100	100	NA	100	100	100	NA	50	50	50	NA
Fraction Ingested	FI	-	0.5	0.5	0.5	NA	0.5	0.5	0.5	NA	1.00	1.00	1.00	NA
Exposure Frequency	EF	day/year	40	40	40	NA	40	40	40	NA	40	40	40	NA
Exposure Duration	ED	year	5	5	5	NA	25	25	25	NA	25	25	25	NA
Body Weight	BW	kg	59	59	59	NA	70	70	70	NA	70	70	70	NA
Averaging Time, Cancer	ATc	day	25550	25,550	25,550	NA	25,550	25,550	25,550	NA	25,550	25,550	25,550	NA
Averaging Time, Noncancer	ATnc	day	1825	1,825	1,825	NA	9,125	9,125	9,125	NA	9,125	9,125	9,125	NA
CHRONIC DAILY INTAKES - INGESTION														
Chronic Daily Intake Cancer	CDI C Ing	mg/kg-day	4.0E-07	1.1E-05	1.5E-06	1.3E-05	1.7E-06	4.8E-05	6.5E-06	5.6E-05	1.7E-06	4.8E-05	6.5E-06	5.6E-05
Chronic Daily Intake Noncancer	CDI NC Ing	mg/kg-day	5.6E-06	1.6E-04	2.1E-05	1.9E-04	4.7E-06	1.3E-04	1.8E-05	1.6E-04	4.7E-06	1.3E-04	1.8E-05	1.6E-04
TOXICITY VALUES - INGESTION														
Slope Factor	SF	$(mg/kg\text{-}d)^{-1}$	1.5	NA	NA	NA	1.5	NA	NA	NA	1.5	NA	NA	NA
Reference Dose	RfD	mg/kg-d	3.00E-04	4.00E-02	NA	NA	3.00E-04	4.00E-02	NA	NA	3.00E-04	4.00E-02	NA	NA
RISK ESTIMATES - INGESTION														
Cancer Risk	$ELCR_{Ingestion}$	unitless	6.0E-07	NA	NA	6.0E-07	2.5E-06	NA	NA	2.5E-06	2.5E-06	NA	NA	2.5E-06
Noncancer Risk	$HQ_{Ingestion}$	unitless	0.02	0.004	NA	0.02	0.02	0.003	NA	0.019	0.02	0.003	NA	0.019
SOIL INHALATION														
Soil Concentration	Conc soil	mg/kg	150	1722	231	NA	150	1722	231	NA	150	1722	231	NA
Particulate Emission Factor	1/PEF	m^3/kg	1.397E+09	1.397E+09	1.397E+09	NA	1.397E+09	1.397E+09	1.397E+09	NA	1.397E+09	1.397E+09	1.397E+09	NA
Inhalation Rate	IHR	m^3/day	15	15	15	NA	20	20	20	NA	20	20	20	NA
Exposure Frequency	EF	day/year	40	40	40	NA	40	40	40	NA	40	40	40	NA
Exposure Duration	ED	year	5	5	5	NA	25	25	25	NA	25	25	25	NA
Body Weight	BW	kg	59	59	59	NA	70	70	70	NA	70	70	70	NA
Averaging Time, Cancer	ATc	day	25550	25550	25550	NA	25550	25550	25550	NA	25550	25550	25550	NA
Averaging Time, Noncancer	ATnc	day	1825	1825	1825	NA	9125	9125	9125	NA	9125	9125	9125	NA
CHRONIC DAILY INTAKES - INHALATION														
Chronic Daily Intake Cancer	CDI C Inh	mg/kg-day	2.1E-10	2.5E-09	3.3E-10	3.0E-09	1.2E-09	1.4E-08	1.9E-09	1.7E-08	1.2E-09	1.4E-08	1.9E-09	1.7E-08
Chronic Daily Intake Noncancer	CDI NC Inh	mg/kg-day	3.0E-09	3.4E-08	4.6E-09	4.2E-08	3.4E-09	3.9E-08	5.2E-09	4.7E-08	3.4E-09	3.9E-08	5.2E-09	4.7E-08
TOXICITY VALUES - INHALATION														
Slope Factor	SF	$(mg/kg\text{-}d)^{-1}$	15	NA	NA	NA	15	NA	NA	NA	15	NA	NA	NA
Reference Dose	RfD	mg/kg-d	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RISK ESTIMATES - INHALATION														
Cancer Risk	$ELCR_{Inhalation}$	unitless	3.2E-09	NA	NA	3.2E-09	1.8E-08	NA	NA	1.8E-08	1.8E-08	NA	NA	1.8E-08
Noncancer Risk	$HQ_{Inhalation}$	unitless	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DERMAL CONTACT														
Soil Concentration	Conc soil	mg/kg	150	1722	231	NA	150	1722	231	NA	150	1722	231	NA
Conversion Factor	CF	kg/mg	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA
Skin Surface Area	SA	cm^2	6700	6700	6700	NA	5700	5700	5700	NA	2127	2127	2127	NA
Soil to Skin Adherence Factor	AF	mg/cm^2	0.04	0.04	0.04	NA	0.01	0.01	0.01	NA	0.20	0.20	0.20	NA
Absorption Value	ABS	%	0.01	0.03	0.03	NA	0.01	0.03	0.03	NA	0.01	0.03	0.03	NA
Exposure Frequency	EF	day/year	40	40	40	NA	40	40	40	NA	40	40	40	NA
Exposure Duration	ED	year	5	5	5	NA	25	25	25	NA	25	25	25	NA
Body Weight	BW	kg	59	59	59	NA	70	70	70	NA	70	70	70	NA
Averaging Time, Cancer	ATc	day	25550	25550	25550	NA	25550	25550	25550	NA	25550	25550	25550	NA
Averaging Time, Noncancer	ATnc	day	1825	1825	1825	NA	9125	9125	9125	NA	9125	9125	9125	NA
CHRONIC DAILY INTAKES - DERMAL														
Chronic Daily Intake Cancer	CDI C Der	mg/kg-day	5.3E-08	1.8E-06	2.5E-07	2.1E-06	4.8E-08	1.6E-06	2.2E-07	1.9E-06	3.6E-07	1.2E-05	1.7E-06	1.4E-05
Chronic Daily Intake Noncancer	CDI NC Der	mg/kg-day	7.5E-07	2.6E-05	3.5E-06	3.0E-05	1.3E-07	4.6E-06	6.2E-07	5.4E-06	1.0E-06	3.4E-05	4.6E-06	4.0E-05
TOXICITY VALUES - DERMAL														
Slope Factor	SF	$(mg/kg\text{-}d)^{-1}$	1.5	NA	NA	NA	1.5	NA	NA	NA	1.5	NA	NA	NA
Reference Dose	RfD	mg/kg-d	0.0003	0.04	NA	NA	0.0003	0.04	NA	NA	0.0003	0.04	NA	NA
RISK ESTIMATES - DERMAL														
Cancer Risk	$ELCR_{Dermal}$	unitless	8.0E-08	NA	NA	8.0E-08	7.2E-08	NA	NA	7.2E-08	5.3E-07	NA	NA	5.3E-07
Noncancer Risk	HQ_{Dermal}	unitless	0.0025	0.00064	NA	0.0031	0.0004	0.00012	NA	0.0006	0.0033	0.00086	NA	0.0042
RISK ESTIMATES - TOTAL														
Cancer Risk	ICR	unitless	7E-07	NA	NA	7E-07	3E-06	NA	NA	3E-06	3E-06	NA	NA	3E-06
Noncancer Risk	HQ	unitless	0.02	0.005	NA	0.03	0.02	0.003	NA	0.02	0.02	0.004	NA	0.02

95% UCL: 95% upper confidence limit based on distribution type (normal, gamma, lognormal, or non-parametric).

1E-06	Excess Lifetime Cancer Risk (ELCR) greater than 10^{-6}
1E-05	Excess Lifetime Cancer Risk (ELCR) greater than 10^{-5}
1	Noncancer Hazard Quotient (HQ) greater than 1

Table 4-4: Reasonable Maximum Exposure Risk Characterization for the Silver King Wash

SILVER KING WASH														
			Preteen Trespasser (6-13 years)				Adult Trespasser (> 18 years)				Adult Worker (> 18 years)			
Parameter	**Code**	**Units**	**Arsenic**	**Copper**	**Lead***	**Total**	**Arsenic**	**Copper**	**Lead***	**Total**	**Arsenic**	**Copper**	**Lead***	**Total**
INCIDENTAL SOIL INGESTION														
Soil Concentration	Conc soil	mg/kg	97	937	107	NA	97	937	107	NA	97	937	107	NA
Bioavailability	Bio	unitless	0.4	1.0	1.0	NA	0.4	1.0	1.0	NA	0.4	1.0	1.0	NA
Conversion Factor	CF	kg/mg	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA
Ingestion Rate	IR Soil	mg/day	100	100	100	NA	100	100	100	NA	50	50	50	NA
Fraction Ingested	FI	-	0.5	0.5	0.5	NA	0.5	0.5	0.5	NA	1.00	1.00	1.00	NA
Exposure Frequency	EF	day/year	80	80	80	NA	80	80	80	NA	80	80	80	NA
Exposure Duration	ED	year	7	7	7	NA	25	25	25	NA	25	25	25	NA
Body Weight	BW	kg	35	35	35	NA	70	70	70	NA	70	70	70	NA
Averaging Time, Cancer	ATc	day	25550	25,550	25,550	NA	25,550	25,550	25,550	NA	25,550	25,550	25,550	NA
Averaging Time, Noncancer	ATnc	day	2555	2,555	2,555	NA	9,125	9,125	9,125	NA	9,125	9,125	9,125	NA
CHRONIC DAILY INTAKES - INGESTION														
Chronic Daily Intake Cancer	CDI C Ing	mg/kg-day	1.2E-06	2.9E-05	3.4E-06	3.4E-05	2.2E-06	5.2E-05	6.0E-06	6.1E-05	2.2E-06	5.2E-05	6.0E-06	6.1E-05
Chronic Daily Intake Noncancer	CDI NC Ing	mg/kg-day	1.2E-05	2.9E-04	3.4E-05	3.4E-04	6.0E-06	1.5E-04	1.7E-05	1.7E-04	6.0E-06	1.5E-04	1.7E-05	1.7E-04
TOXICITY VALUES - INGESTION														
Slope Factor	SF	$(mg/kg\text{-}d)^{-1}$	1.5	NA	NA	NA	1.5	NA	NA	NA	1.5	NA	NA	NA
Reference Dose	RfD	mg/kg-d	3.00E-04	4.00E-02	NA	NA	0.0003	0.04	NA	NA	0.0003	0.04	NA	NA
RISK ESTIMATES - INGESTION														
Cancer Risk	$ELCR_{Ingestion}$	unitless	1.8E-06	NA	NA	1.8E-06	3.2E-06	NA	NA	3.2E-06	3.2E-06	NA	NA	3.2E-06
Noncancer Risk	$HQ_{Ingestion}$	unitless	0.04	0.007	NA	0.048	0.02	0.004	NA	0.024	0.02	0.004	NA	0.024
SOIL INHALATION														
Soil Concentration	Conc soil	mg/kg	97	937	107	NA	97	937	107	NA	97	937	107	NA
Particulate Emission Factor	1/PEF	m^3/kg	1.397E+09	1.397E+09	1.397E+09	NA	1.397E+09	1.397E+09	1.397E+09	NA	1.397E+09	1.397E+09	1.397E+09	NA
Inhalation Rate	IHR	m^3/day	15	15	15	NA	20	20	20	NA	20	20	20	NA
Exposure Frequency	EF	day/year	80	80	80	NA	60	60	60	NA	80	80	80	NA
Exposure Duration	ED	year	7	7	7	NA	25	25	25	NA	25	25	25	NA
Body Weight	BW	kg	35	35	35	NA	70	70	70	NA	70	70	70	NA
Averaging Time, Cancer	ATc	day	25550	25550	25550	NA	25550	25550	25550	NA	25550	25550	25550	NA
Averaging Time, Noncancer	ATnc	day	2555	2555	2555	NA	9125	9125	9125	NA	9125	9125	9125	NA
CHRONIC DAILY INTAKES - INHALATION														
Chronic Daily Intake Cancer	CDI C Inh	mg/kg-day	6.5E-10	6.3E-09	7.2E-10	7.7E-09	1.2E-09	1.1E-08	1.3E-09	1.4E-08	1.5E-09	1.5E-08	1.7E-09	1.8E-08
Chronic Daily Intake Noncancer	CDI NC Inh	mg/kg-day	6.5E-09	6.3E-08	7.2E-09	7.7E-08	3.2E-09	3.2E-08	3.6E-09	3.8E-08	4.3E-09	4.2E-08	4.8E-09	5.1E-08
TOXICITY VALUES - INHALATION														
Slope Factor	SF	$(mg/kg\text{-}d)^{-1}$	15	NA	NA	NA	15	NA	NA	NA	15	NA	NA	NA
Reference Dose	RfD	mg/kg-d	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RISK ESTIMATES - INHALATION														
Cancer Risk	$ELCR_{Inhalation}$	unitless	9.7E-09	NA	NA	9.7E-09	1.7E-08	NA	NA	1.7E-08	2.3E-08	NA	NA	2.3E-08
Noncancer Risk	$HQ_{Inhalation}$	unitless	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DERMAL CONTACT														
Soil Concentration	Conc soil	mg/kg	97	937	107	NA	97	937	107	NA	97	937	107	NA
Conversion Factor	CF	kg/mg	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	1.0E-06	1.0E-06	NA	1.0E-06	0.0E+00	0.0E+00	NA
Skin Surface Area	SA	cm^2	4421	4421	4421	NA	5700	5700	5700	NA	2127	2127	2127	NA
Soil to Skin Adherence Factor	AF	mg/cm^2	0.04	0.04	0.04	NA	0.01	0.01	0.01	NA	0.20	0.20	0.20	NA
Dermal Absorption Value	ABS	%	0.01	0.03	0.03	NA	0.01	0.03	0.03	NA	0.01	0.03	0.03	NA
Exposure Frequency	EF	day/year	80	80	80	NA	80	80	80	NA	80	80	80	NA
Exposure Duration	ED	year	7	7	7	NA	25	25	25	NA	25	25	25	NA
Body Weight	BW	kg	35	35	35	NA	70	70	70	NA	70	70	70	NA
Averaging Time, Cancer	ATc	day	25550	25550	25550	NA	25550	25550	25550	NA	25550	25550	25550	NA
Averaging Time, Noncancer	ATnc	day	2555	2555	2555	NA	9125	9125	9125	NA	9125	9125	9125	NA
CHRONIC DAILY INTAKES - DERMAL														
Chronic Daily Intake Cancer	CDI C Der	mg/kg-day	1.1E-07	3.1E-06	3.6E-07	3.6E-06	6.2E-08	1.8E-06	2.0E-07	2.1E-06	4.6E-07	0.0E+00	0.0E+00	4.6E-07
Chronic Daily Intake Noncancer	CDI NC Der	mg/kg-day	1.1E-06	3.1E-05	3.6E-06	3.6E-05	1.7E-07	5.0E-06	5.7E-07	5.8E-06	1.3E-06	0.0E+00	0.0E+00	1.3E-06
TOXICITY VALUES - DERMAL														
Slope Factor	SF	$(mg/kg\text{-}d)^{-1}$	1.5	NA	NA	NA	1.5	NA	NA	NA	1.5	NA	NA	NA
Reference Dose	RfD	mg/kg-d	0.0003	0.04	NA	NA	0.0003	0.04	NA	NA	0.0003	0.04	NA	NA
RISK ESTIMATES - DERMAL														
Cancer Risk	$ELCR_{Dermal}$	unitless	1.6E-07	NA	NA	1.6E-07	9.2E-08	NA	NA	9.2E-08	6.9E-07	NA	NA	6.9E-07
Noncancer Risk	HQ_{Dermal}	unitless	0.0036	0.00078	NA	0.0043	0.0006	0.00013	NA	0.0007	0.0043	0.00000	NA	0.0043
RISK ESTIMATES - TOTAL														
Cancer Risk	ICR	unitless	2E-06	NA	NA	2E-06	3E-06	NA	NA	3E-06	4E-06	NA	NA	4E-06
Noncancer Risk	HQ	unitless	0.0	0.01	NA	0.1	0.02	0.004	NA	0.02	0.02	0.004	NA	0.03

95% UCL: 95% upper confidence limit based on distribution type (normal, gamma, lognormal, or non-parametric).

* The sample size may not be adequate enough to compute meaningful and reliable test statistics and estimates.

1E-06	Excess Lifetime Cancer Risk (ELCR) greater than 10^{-6}
1E-05	Excess Lifetime Cancer Risk (ELCR) greater than 10^{-5}
1	Noncancer Hazard Quotient (HQ) greater than 1

Table 4-5: Summary Results for Risk-Based Screening Level (RBSL) Calculations

EAST MOUNTAIN FRONT															
RECEPTOR	**Teen Trespasser (13-18 years)**				**Percent**	**Adult Trespasser (> 18 years)**				**Percent**	**Adult Worker (> 18 years)**				**Percent**
PARAMETER	**Arsenic**	**Copper**	**Lead**	**Total**	**Contribution**	**Arsenic**	**Copper**	**Lead**	**Total**	**Contribution**	**Arsenic**	**Copper**	**Lead**	**Total**	**Contribution**
CANCER RISKS															
Ingestion	**1.8E-06**	NA	NA	**2E-06**	87.8%	**7.4E-06**	NA	NA	**7E-06**	96.6%	**7.4E-06**	NA	NA	**7.4E-06**	82.0%
Inhalation	9.4E-09	NA	NA	**9E-09**	0.5%	5.3E-08	NA	NA	**5E-08**	0.7%	5.3E-08	NA	NA	5.3E-08	0.6%
Dermal	2.3E-07	NA	NA	**2E-07**	11.8%	2.1E-07	NA	NA	**2E-07**	2.8%	**1.6E-06**	NA	NA	**1.6E-06**	17.4%
Total	**2E-06**	NA	NA	**2E-06**	**100%**	**8E-06**	NA	NA	**8E-06**	**100%**	**9E-06**	NA	NA	**9E-06**	**100%**
NONCANCER RISKS															
Ingestion	0.05	0.01	NA	**0.1**	87.7%	0.046	0.013	NA	**0.06**	97.1%	0.046	0.013	NA	**0.06**	25.7%
Inhalation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.3E-08	NA	NA	5.3E-08	NA
Dermal	0.0073	0.0024	NA	**0.01**	12.3%	0.0013	0.00043	NA	**0.002**	2.9%	0.0098	0.1596	NA	0.1694	74.3%
Total	**0.1**	**0.02**	NA	**0.1**	**100%**	**0.05**	**0.013**	NA	**0.06**	**100%**	**0.06**	**0.172**	NA	**0.23**	**100%**

INDUSTRIAL AREA															
RECEPTOR	**Teen Trespasser (13-18 years)**				**Percent**	**Adult Trespasser (> 18 years)**				**Percent**	**Adult Worker (> 18 years)**				**Percent**
PARAMETER	**Arsenic**	**Copper**	**Lead**	**Total**	**Contribution**	**Arsenic**	**Copper**	**Lead**	**Total**	**Contribution**	**Arsenic**	**Copper**	**Lead**	**Total**	**Contribution**
CANCER RISKS															
Ingestion	8.6E-07	NA	NA	**9E-07**	82.3%	**3.6E-06**	NA	NA	**4E-06**	94.8%	**9.9E-06**	NA	NA	**9.9E-06**	74.7%
Inhalation	7.1E-09	NA	NA	**7E-09**	0.7%	4.0E-08	NA	NA	**4E-08**	1.0%	1.1E-07	NA	NA	1.1E-07	0.8%
Dermal	1.8E-07	NA	NA	**2E-07**	17.0%	1.6E-07	NA	NA	**2E-07**	4.2%	**3.2E-06**	NA	NA	**3.2E-06**	24.5%
Total	**1.0E-06**	NA	NA	**1E-06**	**100%**	**3.8E-06**	NA	NA	**4E-06**	**100%**	**1.3E-05**	NA	NA	**1.3E-05**	**100%**
NONCANCER RISKS															
Ingestion	0.027	0.0182	NA	**0.04**	81.8%	0.0225	0.0153	NA	**0.04**	95.5%	0.0615	0.0420	NA	0.1035	73.9%
Inhalation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dermal	0.0055	0.0045	NA	**0.010**	18.2%	0.00099	0.00081	NA	**0.0018**	4.5%	0.02014	0.01649	NA	0.03663	26.1%
Total	**0.03**	**0.023**	NA	**0.05**	**100%**	**0.023**	**0.016**	NA	**0.04**	**100%**	**0.082**	**0.058**	NA	**0.14**	**100%**

NORTH MOUNTAIN FRONT															
RECEPTOR	**Teen Trespasser (13 to 18 years)**				**Percent**	**Adult Trespasser (> 18 years)**				**Percent**	**Adult Worker (> 18 years)**				**Percent**
PARAMETER	**Arsenic**	**Copper**	**Lead**	**Total**	**Contribution**	**Arsenic**	**Copper**	**Lead**	**Total**	**Contribution**	**Arsenic**	**Copper**	**Lead**	**Total**	**Contribution**
CANCER RISKS															
Ingestion	6.0E-07	NA	NA	**6E-07**	87.8%	**2.5E-06**	NA	NA	**3E-06**	96.6%	**2.5E-06**	NA	NA	**2.5E-06**	82.0%
Inhalation	3.2E-09	NA	NA	**3E-09**	0.5%	1.8E-08	NA	NA	**2E-08**	0.7%	1.8E-08	NA	NA	1.8E-08	0.6%
Dermal	8.0E-08	NA	NA	**8E-08**	11.8%	7.2E-08	NA	NA	**7E-08**	2.8%	5.3E-07	NA	NA	5.3E-07	17.4%
Total	**7E-07**	NA	NA	**7E-07**	**100%**	**3E-06**	NA	NA	**3E-06**	**100%**	**3E-06**	NA	NA	**3E-06**	**100%**
NONCANCER RISKS															
Ingestion	0.019	0.0040	NA	**0.02**	87.8%	0.016	0.0034	NA	**0.02**	97.1%	0.016	0.003	NA	0.019	82.0%
Inhalation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dermal	0.0025	0.00064	NA	**0.003**	12.2%	0.00045	0.00012	NA	**0.0006**	2.9%	0.00332	0.00086	NA	0.00418	18.0%
Total	**0.02**	**0.005**	NA	**0.03**	**100%**	**0.02**	**0.003**	NA	**0.02**	**100%**	**0.02**	**0.004**	NA	**0.02**	**100%**

SILVER KING WASH TRESPASSERS															
RECEPTOR	**Preteen Trespasser (6-13 years)**				**Percent**	**Adult Trespasser (> 18 years)**				**Percent**	**Adult Worker (> 18 years)**				**Percent**
PARAMETER	**Arsenic**	**Copper**	**Lead**	**Total**	**Contribution**	**Arsenic**	**Copper**	**Lead**	**Total**	**Contribution**	**Arsenic**	**Copper**	**Lead**	**Total**	**Contribution**
CANCER RISKS															
Ingestion	**1.8E-06**	NA	NA	**2E-06**	91.4%	**3.2E-06**	NA	NA	**3E-06**	96.7%	**3.2E-06**	NA	NA	**3.2E-06**	82.0%
Inhalation	9.7E-09	NA	NA	**1E-08**	0.5%	1.7E-08	NA	NA	**2E-08**	0.5%	2.3E-08	NA	NA	2.3E-08	0.6%
Dermal	1.6E-07	NA	NA	**2E-07**	8.1%	9.2E-08	NA	NA	**9E-08**	2.8%	6.9E-07	NA	NA	6.9E-07	17.4%
Total	**2E-06**	NA	NA	**2E-06**	**100%**	**3E-06**	NA	NA	**3E-06**	**100%**	**4E-06**	NA	NA	**4E-06**	**100%**
NONCANCER RISKS															
Ingestion	0.04	0.007	NA	**0.0**	91.6%	0.020	0.0037	NA	**0.02**	97.1%	0.020	0.004	NA	0.024	84.7%
Inhalation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dermal	0.0036	0.00078	NA	**0.004**	8.4%	0.00057	0.00013	NA	**0.0007**	2.9%	0.00429	0.00000	NA	0.00429	15.3%
Total	**0.0**	**0.01**	NA	**0.1**	**100%**	**0.02**	**0.004**	NA	**0.02**	**100%**	**0.02**	**0.004**	NA	**0.03**	**100%**

1E-06	Excess Lifetime Cancer Risk (ELCR) greater than 10^{-6}
1E-05	Excess Lifetime Cancer Risk (ELCR) greater than 10^{-5}
1	Noncancer Hazard Quotient (HQ) greater than 1

Golder Associates

Table 4-6: Summary of Risk-Based Screening Levels (RBSLs) for the West Plant Site

EAST MOUNTAIN FRONT				
Parameter	**Code**	**Teen Trespasser (13-18 years)**	**Trespasser (> 18 years)**	**Adult Worker (> 18 years)**
Arsenic Maximum Observed Value		**387**		
Arsenic 95% UCL		**220**		
$ELCR_{Ingestion} = 10^{-6}$	$C\ RBSL_{Ingestion}$	126	30	30
$ELCR_{Ingestion} = 10^{-5}$	$C\ RBSL_{Ingestion}$	1,256	298	298
$ELCR_{Ingestion} = 10^{-4}$	$C\ RBSL_{Ingestion}$	12,562	2,981	2,981
$ELCR_{Inhalation} = 10^{-6}$	$C\ RBSL_{Inhalation}$	23,393	4,163	4,163
$ELCR_{Inhalation} = 10^{-5}$	$C\ RBSL_{Inhalation}$	233,931	41,632	41,632
$ELCR_{Inhalation} = 10^{-4}$	$C\ RBSL_{Inhalation}$	2,339,308	416,318	416,318
$ELCR_{Dermal} = 10^{-6}$	$C\ RBSL_{Dermal}$	937	1,046	140
$ELCR_{Dermal} = 10^{-5}$	$C\ RBSL_{Dermal}$	9,375	10,459	1,401
$ELCR_{Dermal} = 10^{-4}$	$C\ RBSL_{Dermal}$	93,747	104,591	14,014

INDUSTRIAL AREA				
Arsenic Maximum Observed Value		**490**		
Arsenic 95% UCL		**166**		
Parameter	**Code**	**Teen Trespasser (13-18 years)**	**Adult Trespasser**	**Adult Worker (> 18 years)**
$ELCR_{Ingestion} = 10^{-6}$	$C\ RBSL_{Ingestion}$	193	46	17
$ELCR_{Ingestion} = 10^{-5}$	$C\ RBSL_{Ingestion}$	1,933	459	168
$ELCR_{Ingestion} = 10^{-4}$	$C\ RBSL_{Ingestion}$	19,326	4,586	1,675
$ELCR_{Inhalation} = 10^{-6}$	$C\ RBSL_{Inhalation}$	23,393	4,163	1,521
$ELCR_{Inhalation} = 10^{-5}$	$C\ RBSL_{Inhalation}$	233,931	41,632	15,208
$ELCR_{Inhalation} = 10^{-4}$	$C\ RBSL_{Inhalation}$	2,339,308	416,318	152,079
$ELCR_{Dermal} = 10^{-6}$	$C\ RBSL_{Dermal}$	937	1,046	51
$ELCR_{Dermal} = 10^{-5}$	$C\ RBSL_{Dermal}$	9,375	10,459	512
$ELCR_{Dermal} = 10^{-4}$	$C\ RBSL_{Dermal}$	93,747	104,591	5,119

NORTH MOUNTAIN FRONT				
Arsenic Maximum Observed Value		**360**		
Arsenic 95% UCL		**150**		
Parameter	**Code**	**Teen Trespasser (13-18 years)**	**Trespasser (> 18 years)**	**Adult Worker (> 18 years)**
$ELCR_{Ingestion} = 10^{-6}$	$C\ RBSL_{Ingestion}$	251	60	60
$ELCR_{Ingestion} = 10^{-5}$	$C\ RBSL_{Ingestion}$	2,512	596	596
$ELCR_{Ingestion} = 10^{-4}$	$C\ RBSL_{Ingestion}$	25,124	5,962	5,962
$ELCR_{Inhalation} = 10^{-6}$	$C\ RBSL_{Inhalation}$	46,786	8,326	8,326
$ELCR_{Inhalation} = 10^{-5}$	$C\ RBSL_{Inhalation}$	467,862	83,264	83,264
$ELCR_{Inhalation} = 10^{-4}$	$C\ RBSL_{Inhalation}$	4,678,616	832,635	832,635
$ELCR_{Dermal} = 10^{-6}$	$C\ RBSL_{Dermal}$	1,875	2,092	280
$ELCR_{Dermal} = 10^{-5}$	$C\ RBSL_{Dermal}$	18,749	20,918	2,803
$ELCR_{Dermal} = 10^{-4}$	$C\ RBSL_{Dermal}$	187,494	209,181	28,029

Table 4-6: Summary of Risk-Based Screening Levels (RBSLs) for the West Plant Site

SILVER KING WASH				
Arsenic Maximum Observed Value		**127**		
Arsenic 95% UCL		**97**		
Parameter	**Code**	**Preteen Trespasser**	**Adult Trespasser**	**Adult Worker (> 18 years)**
$ELCR_{Ingestion} = 10^{-6}$	C RBSL $_{Ingestion}$	53	30	30
$ELCR_{Ingestion} = 10^{-5}$	C RBSL $_{Ingestion}$	532	298	298
$ELCR_{Ingestion} = 10^{-4}$	C RBSL $_{Ingestion}$	5,323	2,981	2,981
$ELCR_{Inhalation} = 10^{-6}$	C RBSL $_{Inhalation}$	9,912	5,551	4,163
$ELCR_{Inhalation} = 10^{-5}$	C RBSL $_{Inhalation}$	99,123	55,509	41,632
$ELCR_{Inhalation} = 10^{-4}$	C RBSL $_{Inhalation}$	991,232	555,090	416,318
$ELCR_{Dermal} = 10^{-6}$	C RBSL $_{Dermal}$	602	1,046	140
$ELCR_{Dermal} = 10^{-5}$	C RBSL $_{Dermal}$	6,020	10,459	1,401
$ELCR_{Dermal} = 10^{-4}$	C RBSL $_{Dermal}$	60,200	104,591	14,014

Notes:
* Arsenic is the only carcinogen
There were no unacceptable noncarcinogenic risks
Shaded areas indicate a RBSL value that is below the maximum observed value in that land use area

Tables 4-7: Noncarcinogenic Risk-Based Screening Levels (RBSLs) for the West Plant Site

EAST MOUNTAIN FRONT							
		Teen Trespasser		Adult Trespasser		Adult Worker	
Parameter	Code	Arsenic (mg/kg)	Copper (mg/kg)	Arsenic (mg/kg)	Copper (mg/kg)	Arsenic (mg/kg)	Copper (mg/kg)
Maximum Observed Value		**387**	**4,800**	**387**	**4,800**	**387**	**4,800**
$HQ_{Ingestion} = 1$	NC $RBSL_{Ingestion}$	4,038	215,350	4,791	255,500	4,791	255,500
$HQ_{Inhalation} = 1$	NC $RBSL_{Inhalation}$	NA	NA	NA	NA	NA	NA
$HQ_{Dermal} = 1$	NC $RBSL_{Dermal}$	30,133	1,339,241	168,092	7,470,760	22,523	20,020

INDUSTRIAL AREA							
		Teen Trespasser		Adult Trespasser		Adult Worker	
Parameter	Code	Arsenic (mg/kg)	Copper (mg/kg)	Arsenic (mg/kg)	Copper (mg/kg)	Arsenic (mg/kg)	Copper (mg/kg)
Maximum Observed Value		**490**	**59,000**	**490**	**59,000**	**490**	**59,000**
$HQ_{Ingestion} = 1$	NC $RBSL_{Ingestion}$	6,212	331,308	7,370	393,077	2,692	143,590
$HQ_{Inhalation} = 1$	NC $RBSL_{Inhalation}$	NA	NA	NA	NA	NA	NA
$HQ_{Dermal} = 1$	NC $RBSL_{Dermal}$	30,133	1,339,241	168,092	7,470,760	8,228	365,669

NORTH MOUNTAIN FRONT							
		Teen Trespasser		Adult Trespasser		Adult Worker	
Parameter	Code	Arsenic (mg/kg)	Copper (mg/kg)	Arsenic (mg/kg)	Copper (mg/kg)	Arsenic (mg/kg)	Copper (mg/kg)
Maximum Observed Value		**360**	**4,400**	**360**	**4,400**	**360**	**4,400**
$HQ_{Ingestion} = 1$	NC $RBSL_{Ingestion}$	8,076	430,700	9,581	511,000	9,581	511,000
$HQ_{Inhalation} = 1$	NC $RBSL_{Inhalation}$	NA	NA	NA	NA	NA	NA
$HQ_{Dermal} = 1$	NC $RBSL_{Dermal}$	60,266	2,678,483	336,184	14,941,520	45,046	2,002,037

SILVER KING WASH							
		Preteen Trespasser		Adult Trespasser		Adult Worker	
Parameter	Code	Arsenic (mg/kg)	Copper (mg/kg)	Arsenic (mg/kg)	Copper (mg/kg)	Arsenic (mg/kg)	Copper (mg/kg)
Maximum Observed Value		**127**	**1130**	**127**	**1,130**	**127**	**1,130**
$HQ_{Ingestion} = 1$	NC $RBSL_{Ingestion}$	2,395	127,750	4,791	255,500	4,791	255,500
$HQ_{Inhalation} = 1$	NC $RBSL_{Inhalation}$	NA	NA	NA	NA	NA	NA
$HQ_{Dermal} = 1$	NC $RBSL_{Dermal}$	27,090	1,204,007	168,092	7,470,760	22,523	1,001,019

Table 4-8: Development of Risk-Based Screening Levels for the West Plant Site

Exposure Area	RBSL (arsenic in mg/kg)	Number of Samples Predicted by	Number of Existing Samples	Number of Additional Samples Needed
East Mountain Front (Trespassing)	300	15	19	---
Industrial Area (Industrial)	170	48	72	---
North Mountain Front (Trespassing)	600	12	37	---
Silver King Wash (Trespassing)	300	11	11	---

ATTACHMENT A
VSP REPORTS

ATTACHMENT 1:
VSP REPORT FOR EAST MOUNTAIN FRONT

Random sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

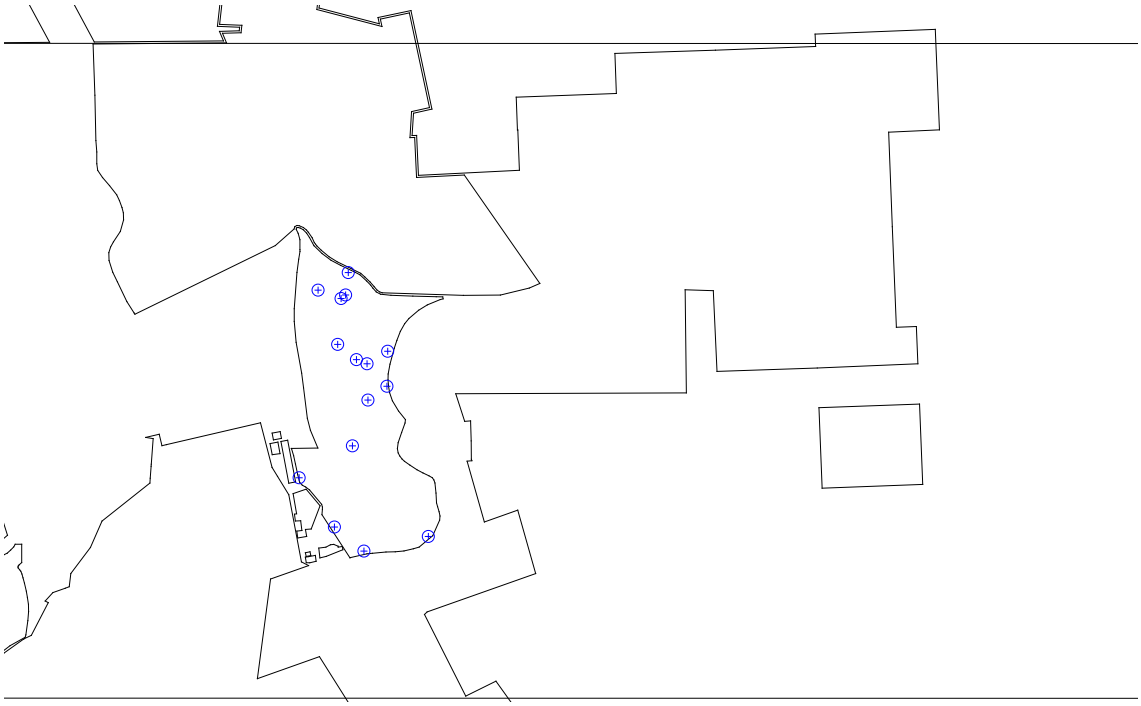
Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Simple random sampling
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	15
Number of samples on map [a]	15
Number of selected sample areas [b]	1
Specified sampling area [c]	6499274.86 ft^2
Total cost of sampling [d]	$8,500.00

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Including measurement analyses and fixed overhead costs. See the Cost of Sampling section for an explanation of the costs presented here.



Area: Area 1					
X Coord	**Y Coord**	**Label**	**Value**	**Type**	**Historical**
951679.4515	839098.8624			Random	
951514.1142	835641.4237			Random	
951998.3749	838073.6587			Random	
951561.9372	838362.4871			Random	
951841.1811	838135.9890			Random	
950990.3727	836375.8639			Random	
952305.2600	838260.2507			Random	
951271.0402	839170.9749			Random	
951611.9848	839046.1829			Random	
952907.9465	835501.6686			Random	
952011.5045	837532.9519			Random	
952293.5769	837738.3811			Random	
951781.1918	836851.4041			Random	
951718.7595	839432.2596			Random	
951951.6231	835283.6580			Random	

Primary Sampling Objective

The primary purpose of sampling at this site is to compare a site median or mean value with a fixed threshold. The working hypothesis (or 'null' hypothesis) is that the median(mean) value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the median(mean) value is less than the threshold. VSP calculates the number of samples required to reject the null hypothesis in favor of the alternative one, given a selected sampling approach and inputs to the associated equation.

Selected Sampling Approach

A nonparametric random sampling approach was used to determine the number of samples and to specify sampling locations. A nonparametric formula was chosen because the conceptual model and historical information (e.g., historical data from this site or a very similar site) indicate that typical parametric assumptions may not be true.

Both parametric and non-parametric equations rely on assumptions about the population. Typically, however, non-parametric equations require fewer assumptions and allow for more uncertainty about the

statistical distribution of values at the site. The trade-off is that if the parametric assumptions are valid, the required number of samples is usually less than if a non-parametric equation was used.

Locating the sample points randomly provides data that are separated by many distances, whereas systematic samples are all equidistant apart. Therefore, random sampling provides more information about the spatial structure of the potential contamination than systematic sampling does. As with systematic sampling, random sampling also provides information regarding the mean value, but there is the possibility that areas of the site will not be represented with the same frequency as if uniform grid sampling were performed.

Number of Total Samples: Calculation Equation and Inputs

The equation used to calculate the number of samples is based on a Sign test (see PNNL 13450 for discussion). For this site, the null hypothesis is rejected in favor of the alternative one if the median(mean) is sufficiently smaller than the threshold. The number of samples to collect is calculated so that if the inputs to the equation are true, the calculated number of samples will cause the null hypothesis to be rejected.

The formula used to calculate the number of samples is:

$$n = \frac{(Z_{1-\alpha} + Z_{1-\beta})^2}{4(SignP - 0.5)^2}$$

where

$$SignP = \Phi\left(\frac{\Delta}{s_{total}}\right)$$

$\Phi(z)$ is the cumulative standard normal distribution on $(-\infty,z)$ (see PNNL-13450 for details),
n is the number of samples,
S_{total} is the estimated standard deviation of the measured values including analytical error,
Δ is the width of the gray region,
α is the acceptable probability of incorrectly concluding the site median(mean) is less than the threshold,
β is the acceptable probability of incorrectly concluding the site median(mean) exceeds the threshold,
$Z_{1-\alpha}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\alpha}$ is $1-\alpha$,
$Z_{1-\beta}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\beta}$ is $1-\beta$.

Note: MARSSIM suggests that the number of samples should be increased by at least 20% to account for missing or unusable data and uncertainty in the calculated value of n. VSP allows a user-supplied percent overage as discussed in MARSSIM (EPA 2000, p. 5-33).

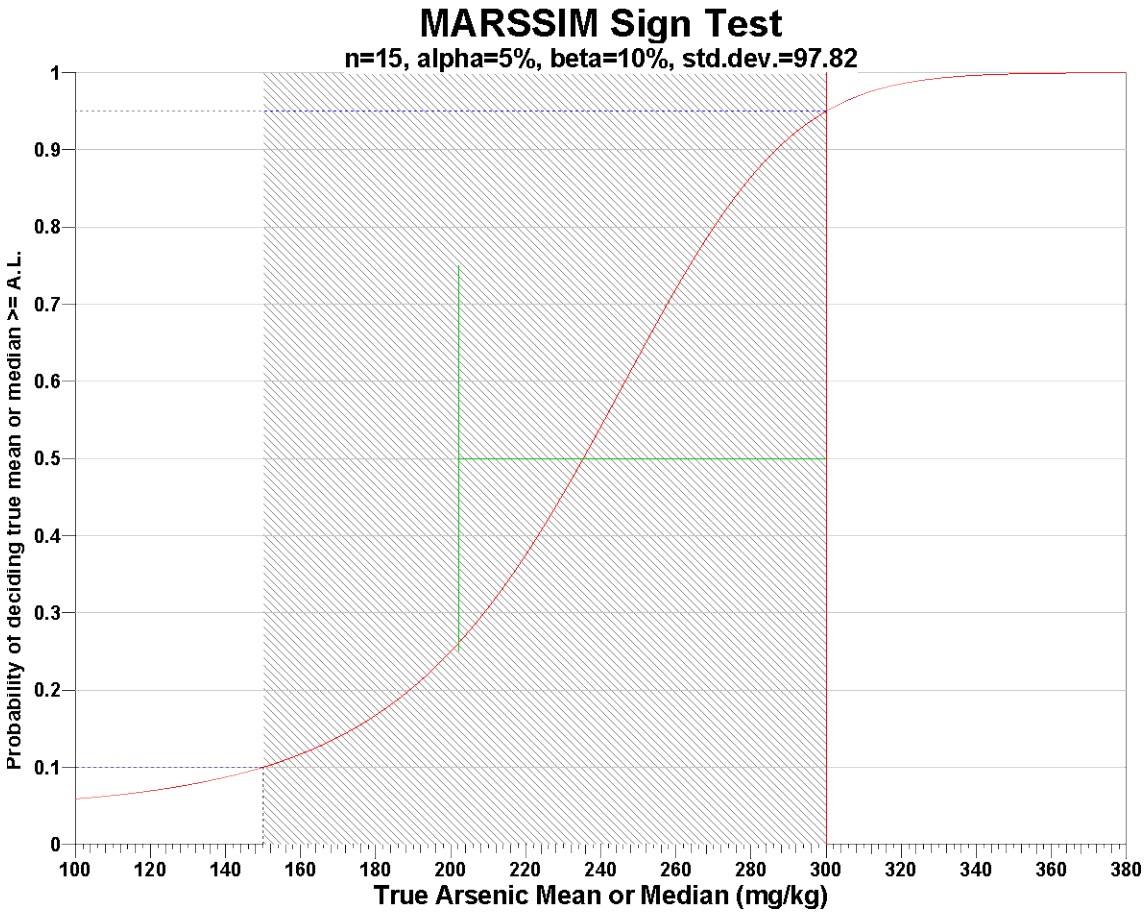
The values of these inputs that result in the calculated number of sampling locations are:

Analyte	n[a]	Parameter					
		S	Δ	α	β	$Z_{1-\alpha}$ [b]	$Z_{1-\beta}$ [c]
Arsenic	15	97.82 mg/kg	150 mg/kg	0.05	0.1	1.64485	1.28155

[a] The final number of samples has been increased by the MARSSIM Overage of 20%.
[b] This value is automatically calculated by VSP based upon the user defined value of α.
[c] This value is automatically calculated by VSP based upon the user defined value of β.

The following figure is a performance goal diagram, described in EPA's QA/G-4 guidance (EPA, 2000). It shows the probability of concluding the sample area is dirty on the vertical axis versus a range of possible true median(mean) values for the site on the horizontal axis. This graph contains all of the inputs to the number of samples equation and pictorially represents the calculation.

The red vertical line is shown at the threshold (action limit) on the horizontal axis. The width of the gray shaded area is equal to Δ; the upper horizontal dashed blue line is positioned at 1-α on the vertical axis; the lower horizontal dashed blue line is positioned at β on the vertical axis. The vertical green line is positioned at one standard deviation below the threshold. The shape of the red curve corresponds to the estimates of variability. The calculated number of samples results in the curve that passes through the lower bound of Δ at β and the upper bound of Δ at 1-α. If any of the inputs change, the number of samples that result in the correct curve changes.



Statistical Assumptions

The assumptions associated with the formulas for computing the number of samples are:

1. the computed sign test statistic is normally distributed,
2. the variance estimate, S^2, is reasonable and representative of the population being sampled,
3. the population values are not spatially or temporally correlated, and
4. the sampling locations will be selected randomly.

The first three assumptions will be assessed in a post data collection analysis. The last assumption is valid because the sample locations were selected using a random process.

Sensitivity Analysis

The sensitivity of the calculation of number of samples was explored by varying the standard deviation, lower bound of gray region (% of action level), beta (%), probability of mistakenly concluding that $\mu >$ action level and alpha (%), probability of mistakenly concluding that $\mu <$ action level. The following table shows the results of this analysis.

Number of Samples							
AL=300		**α=5**		**α=10**		**α=15**	
		s=195.64	**s=97.82**	**s=195.64**	**s=97.82**	**s=195.64**	**s=97.82**
LBGR=90	**β=5**	875	225	693	178	582	149
	β=10	693	178	532	137	435	112
	β=15	582	149	435	112	348	90
LBGR=80	**β=5**	225	63	178	50	149	41
	β=10	178	50	137	38	112	32
	β=15	149	41	112	32	90	26
LBGR=70	**β=5**	105	33	83	26	70	22
	β=10	83	26	64	20	52	17
	β=15	70	22	52	17	42	14

s = Standard Deviation
LBGR = Lower Bound of Gray Region (% of Action Level)
β = Beta (%), Probability of mistakenly concluding that $\mu >$ action level
α = Alpha (%), Probability of mistakenly concluding that $\mu <$ action level
AL = Action Level (Threshold)

Cost of Sampling

The total cost of the completed sampling program depends on several cost inputs, some of which are fixed, and others that are based on the number of samples collected and measured. Based on the numbers of samples determined above, the estimated total cost of sampling and analysis at this site is $8,500.00, which averages out to a per sample cost of $566.67. The following table summarizes the inputs and resulting cost estimates.

COST INFORMATION			
Cost Details	**Per Analysis**	**Per Sample**	**15 Samples**
Field collection costs		$100.00	$1,500.00
Analytical costs	$400.00	$400.00	$6,000.00
Sum of Field & Analytical costs		**$500.00**	**$7,500.00**
Fixed planning and validation costs			$1,000.00
Total cost			**$8,500.00**

Recommended Data Analysis Activities

Post data collection activities generally follow those outlined in EPA's Guidance for Data Quality Assessment (EPA, 2000). The data analysts will become familiar with the context of the problem and goals for data collection and assessment. The data will be verified and validated before being subjected to statistical or other analyses. Graphical and analytical tools will be used to verify to the extent possible the assumptions of any statistical analyses that are performed as well as to achieve a general understanding of the data. The data will be assessed to determine whether they are adequate in both quality and quantity to support the primary objective of sampling.

Because the primary objective for sampling for this site is to compare the site median(mean) value with a threshold value, the data will be assessed in this context. Assuming the data are adequate, at least one statistical test will be done to perform a comparison between the data and the threshold of interest. Results of the exploratory and quantitative assessments of the data will be reported, along with conclusions that may be supported by them.

ATTACHMENT 2:
VSP REPORT FOR INDUSTRIAL AREA

Random sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

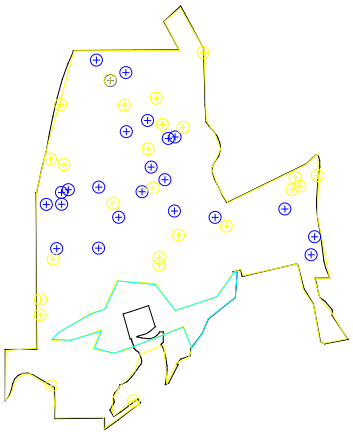
Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Simple random sampling
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	48
Number of samples on map [a]	48
Number of selected sample areas [b]	2
Specified sampling area [c]	77633668.38 ft^2
Total cost of sampling [d]	$25,000.00

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Including measurement analyses and fixed overhead costs. See the Cost of Sampling section for an explanation of the costs presented here.



Area: Area 3					
X Coord	**Y Coord**	**Label**	**Value**	**Type**	**Historical**
911550.1683	839749.6512			Random	
912166.0982	838586.7233			Random	
912005.1456	840508.9264			Random	
909056.8376	837591.3673			Random	
908781.9779	838762.5206			Random	
910894.6439	840690.3739			Random	
909181.6252	839079.8020			Random	
911309.9238	839098.0905			Random	
913239.7282	838418.4620			Random	
915867.9476	837905.6541			Random	
909185.4058	838767.4681			Random	
911913.9961	839415.6686			Random	
910693.3625	838421.3012			Random	
910106.3166	842585.5193			Random	
915082.2754	838640.6621			Random	
912181.3761	840550.5653			Random	
910164.6375	837604.6229			Random	
910472.8456	842043.7765			Random	
909364.3641	839153.3365			Random	
915776.2857	837428.7222			Random	
910167.9692	839221.3321			Random	
910883.3326	842254.8159			Random	
911457.5049	840985.7658			Random	

Area: Area 4					
X Coord	Y Coord	Label	Value	Type	Historical
912392.9488	840801.8115			Random	
915354.0092	839473.7930			Random	
911470.9561	840236.5073			Random	
910468.0907	842059.1111			Random	
911088.2270	833558.8526			Random	
910842.4228	841390.5910			Random	
909245.6682	839817.2001			Random	
911759.9044	837355.1062			Random	
913535.7606	838189.0325			Random	
911602.8459	839204.8667			Random	
912921.8734	842785.7516			Random	
915938.0843	839528.2334			Random	
909162.6119	841408.2479			Random	
908891.6919	839963.2261			Random	
908620.6432	835833.8817			Random	
908962.8978	837311.2007			Random	
910547.3123	838792.3054			Random	
912275.8904	837950.0065			Random	
908630.8533	836245.7308			Random	
908912.3214	833958.9400			Random	
911766.3310	837157.9335			Random	
915269.7887	839152.5797			Random	
915478.9653	839250.0426			Random	
911686.6283	841577.8069			Random	
911845.8874	840880.5144			Random	

Primary Sampling Objective

The primary purpose of sampling at this site is to compare a site median or mean value with a fixed threshold. The working hypothesis (or 'null' hypothesis) is that the median(mean) value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the median(mean) value is less than the threshold. VSP calculates the number of samples required to reject the null hypothesis in favor of the alternative one, given a selected sampling approach and inputs to the associated equation.

Selected Sampling Approach

A nonparametric random sampling approach was used to determine the number of samples and to specify sampling locations. A nonparametric formula was chosen because the conceptual model and historical information (e.g., historical data from this site or a very similar site) indicate that typical parametric assumptions may not be true.

Both parametric and non-parametric equations rely on assumptions about the population. Typically, however, non-parametric equations require fewer assumptions and allow for more uncertainty about the statistical distribution of values at the site. The trade-off is that if the parametric assumptions are valid, the required number of samples is usually less than if a non-parametric equation was used.

Locating the sample points randomly provides data that are separated by many distances, whereas systematic samples are all equidistant apart. Therefore, random sampling provides more information about the spatial structure of the potential contamination than systematic sampling does. As with systematic sampling, random sampling also provides information regarding the mean value, but there is the possibility that areas of the site will not be represented with the same frequency as if uniform grid sampling were performed.

Number of Total Samples: Calculation Equation and Inputs

The equation used to calculate the number of samples is based on a Sign test (see PNNL 13450 for discussion). For this site, the null hypothesis is rejected in favor of the alternative one if the median(mean) is sufficiently smaller than the threshold. The number of samples to collect is calculated so that if the inputs to the equation are true, the calculated number of samples will cause the null hypothesis to be rejected.

The formula used to calculate the number of samples is:

$$n = \frac{(Z_{1-\alpha} + Z_{1-\beta})^2}{4(SignP - 0.5)^2}$$

where

$$SignP = \Phi\left(\frac{\Delta}{s_{total}}\right)$$

$\Phi(z)$ is the cumulative standard normal distribution on $(-\infty,z)$ (see PNNL-13450 for details),
n is the number of samples,
S_{total} is the estimated standard deviation of the measured values including analytical error,
Δ is the width of the gray region,
α is the acceptable probability of incorrectly concluding the site median(mean) is less than the threshold,
β is the acceptable probability of incorrectly concluding the site median(mean) exceeds the threshold,
$Z_{1-\alpha}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\alpha}$ is $1-\alpha$,
$Z_{1-\beta}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\beta}$ is $1-\beta$.

Note: MARSSIM suggests that the number of samples should be increased by at least 20% to account for missing or unusable data and uncertainty in the calculated value of n. VSP allows a user-supplied percent overage as discussed in MARSSIM (EPA 2000, p. 5-33).

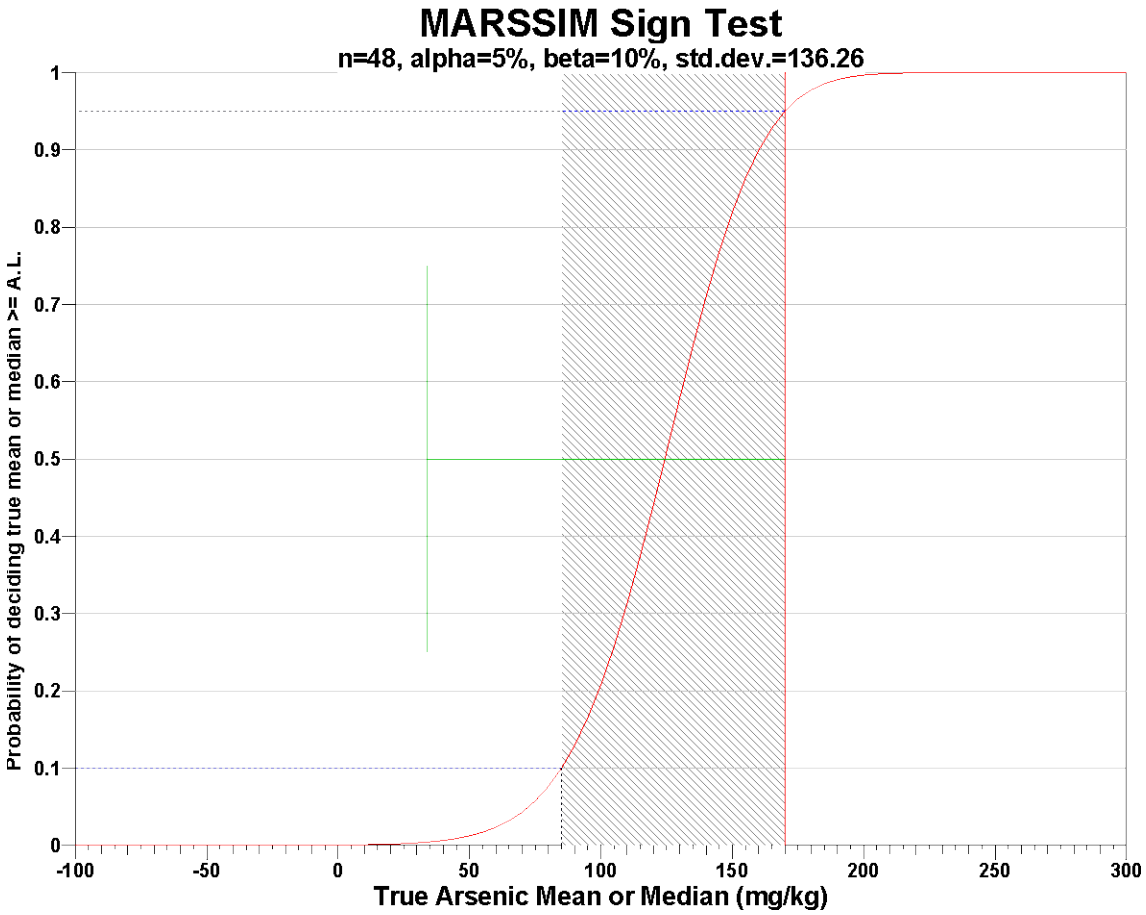
The values of these inputs that result in the calculated number of sampling locations are:

Analyte	n[a]	Parameter					
		S	Δ	α	β	$Z_{1-\alpha}$ [b]	$Z_{1-\beta}$ [c]
Arsenic	48	136.26 mg/kg	85 mg/kg	0.05	0.1	1.64485	1.28155

[a] The final number of samples has been increased by the MARSSIM Overage of 20%.
[b] This value is automatically calculated by VSP based upon the user defined value of α.
[c] This value is automatically calculated by VSP based upon the user defined value of β.

The following figure is a performance goal diagram, described in EPA's QA/G-4 guidance (EPA, 2000). It shows the probability of concluding the sample area is dirty on the vertical axis versus a range of possible true median(mean) values for the site on the horizontal axis. This graph contains all of the inputs to the number of samples equation and pictorially represents the calculation.

The red vertical line is shown at the threshold (action limit) on the horizontal axis. The width of the gray shaded area is equal to Δ; the upper horizontal dashed blue line is positioned at $1-\alpha$ on the vertical axis; the lower horizontal dashed blue line is positioned at β on the vertical axis. The vertical green line is positioned at one standard deviation below the threshold. The shape of the red curve corresponds to the estimates of variability. The calculated number of samples results in the curve that passes through the lower bound of Δ at β and the upper bound of Δ at $1-\alpha$. If any of the inputs change, the number of samples that result in the correct curve changes.



Statistical Assumptions

The assumptions associated with the formulas for computing the number of samples are:

1. the computed sign test statistic is normally distributed,
2. the variance estimate, S^2, is reasonable and representative of the population being sampled,
3. the population values are not spatially or temporally correlated, and
4. the sampling locations will be selected randomly.

The first three assumptions will be assessed in a post data collection analysis. The last assumption is valid because the sample locations were selected using a random process.

Sensitivity Analysis

The sensitivity of the calculation of number of samples was explored by varying the standard deviation, lower bound of gray region (% of action level), beta (%), probability of mistakenly concluding that $\mu >$ action level and alpha (%), probability of mistakenly concluding that $\mu <$ action level. The following table shows the results of this analysis.

Number of Samples							
AL=170		α=5		α=10		α=15	
		s=272.52	s=136.26	s=272.52	s=136.26	s=272.52	s=136.26
LBGR=90	β=5	5250	1318	4155	1043	3488	876
	β=10	4155	1043	3188	801	2607	656
	β=15	3488	876	2607	656	2085	524
LBGR=80	β=5	1318	335	1043	266	876	224
	β=10	1043	266	801	204	656	167
	β=15	876	224	656	167	524	134
LBGR=70	β=5	591	154	467	122	393	102
	β=10	467	122	359	94	293	77
	β=15	393	102	293	77	234	62

s = Standard Deviation
LBGR = Lower Bound of Gray Region (% of Action Level)
β = Beta (%), Probability of mistakenly concluding that μ > action level
α = Alpha (%), Probability of mistakenly concluding that μ < action level
AL = Action Level (Threshold)

Cost of Sampling
The total cost of the completed sampling program depends on several cost inputs, some of which are fixed, and others that are based on the number of samples collected and measured. Based on the numbers of samples determined above, the estimated total cost of sampling and analysis at this site is $25,000.00, which averages out to a per sample cost of $520.83. The following table summarizes the inputs and resulting cost estimates.

COST INFORMATION			
Cost Details	**Per Analysis**	**Per Sample**	**48 Samples**
Field collection costs		$100.00	$4,800.00
Analytical costs	$400.00	$400.00	$19,200.00
Sum of Field & Analytical costs		**$500.00**	**$24,000.00**
Fixed planning and validation costs			$1,000.00
Total cost			**$25,000.00**

Recommended Data Analysis Activities
Post data collection activities generally follow those outlined in EPA's Guidance for Data Quality Assessment (EPA, 2000). The data analysts will become familiar with the context of the problem and goals for data collection and assessment. The data will be verified and validated before being subjected to statistical or other analyses. Graphical and analytical tools will be used to verify to the extent possible the assumptions of any statistical analyses that are performed as well as to achieve a general understanding of the data. The data will be assessed to determine whether they are adequate in both quality and quantity to support the primary objective of sampling.

Because the primary objective for sampling for this site is to compare the site median(mean) value with a threshold value, the data will be assessed in this context. Assuming the data are adequate, at least one statistical test will be done to perform a comparison between the data and the threshold of interest. Results of the exploratory and quantitative assessments of the data will be reported, along with conclusions that may be supported by them.

ATTACHMENT 3:
VSP REPORT FOR THE NORTH MOUNTAN FRONT

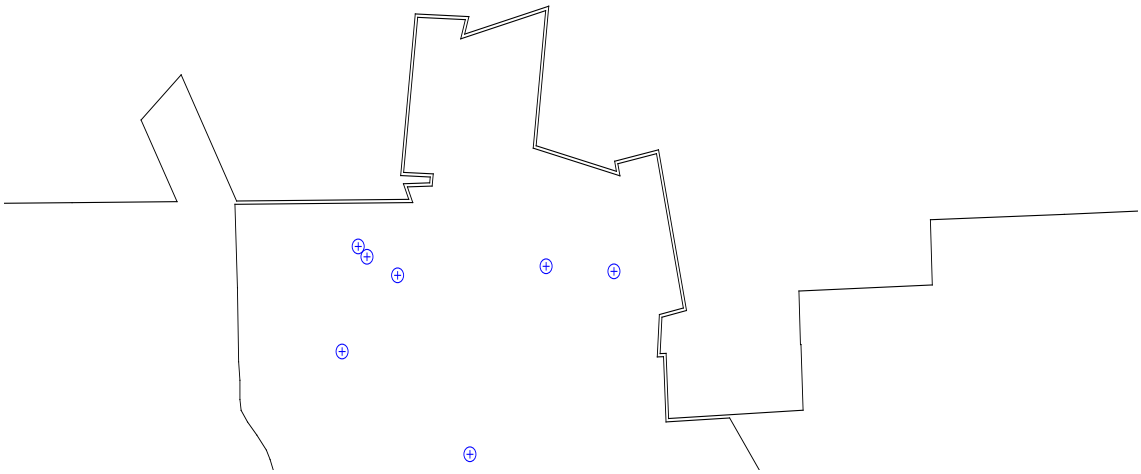
Random sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Simple random sampling
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	12
Number of samples on map [a]	12
Number of selected sample areas [b]	1
Specified sampling area [c]	21285897.69 ft^2
Total cost of sampling [d]	$7,000.00

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Including measurement analyses and fixed overhead costs. See the Cost of Sampling section for an explanation of the costs presented here.



Area: Area 1					
X Coord	Y Coord	Label	Value	Type	Historical
952903.6032	840330.9264			Random	
949400.7015	842357.9261			Random	
949303.6206	842452.4603			Random	
952152.6851	842224.6755			Random	
951970.1870	839801.8888			Random	
950547.8683	840553.8127			Random	
949123.5890	841492.7354			Random	
949742.0745	842188.4224			Random	
951396.5119	842271.4639			Random	
954257.6498	839652.6775			Random	
953316.7613	839513.7413			Random	
948916.7039	840288.3944			Random	

Primary Sampling Objective
The primary purpose of sampling at this site is to compare a site median or mean value with a fixed threshold. The working hypothesis (or 'null' hypothesis) is that the median(mean) value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the median(mean) value is less than the threshold. VSP calculates the number of samples required to reject the null hypothesis in favor of the alternative one, given a selected sampling approach and inputs to the associated equation.

Selected Sampling Approach
A nonparametric random sampling approach was used to determine the number of samples and to specify sampling locations. A nonparametric formula was chosen because the conceptual model and historical information (e.g., historical data from this site or a very similar site) indicate that typical parametric assumptions may not be true.

Both parametric and non-parametric equations rely on assumptions about the population. Typically, however, non-parametric equations require fewer assumptions and allow for more uncertainty about the statistical distribution of values at the site. The trade-off is that if the parametric assumptions are valid, the required number of samples is usually less than if a non-parametric equation was used.

Locating the sample points randomly provides data that are separated by many distances, whereas systematic samples are all equidistant apart. Therefore, random sampling provides more information about the spatial structure of the potential contamination than systematic sampling does. As with systematic sampling, random sampling also provides information regarding the mean value, but there is the possibility that areas of the site will not be represented with the same frequency as if uniform grid sampling were performed.

Number of Total Samples: Calculation Equation and Inputs
The equation used to calculate the number of samples is based on a Sign test (see PNNL 13450 for discussion). For this site, the null hypothesis is rejected in favor of the alternative one if the median(mean) is sufficiently smaller than the threshold. The number of samples to collect is calculated so that if the inputs to the equation are true, the calculated number of samples will cause the null hypothesis to be rejected.

The formula used to calculate the number of samples is:

$$n = \frac{(Z_{1-\alpha} + Z_{1-\beta})^2}{4(SignP - 0.5)^2}$$

where

$$SignP = \Phi\left(\frac{\Delta}{s_{total}}\right)$$

$\Phi(z)$ is the cumulative standard normal distribution on $(-\infty,z)$ (see PNNL-13450 for details),
n is the number of samples,
S_{total} is the estimated standard deviation of the measured values including analytical error,
Δ is the width of the gray region,
α is the acceptable probability of incorrectly concluding the site median(mean) is less than the threshold,
β is the acceptable probability of incorrectly concluding the site median(mean) exceeds the threshold,
$Z_{1-\alpha}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\alpha}$ is $1-\alpha$,
$Z_{1-\beta}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\beta}$ is $1-\beta$.

Note: MARSSIM suggests that the number of samples should be increased by at least 20% to account for missing or unusable data and uncertainty in the calculated value of n. VSP allows a user-supplied percent overage as discussed in MARSSIM (EPA 2000, p. 5-33).

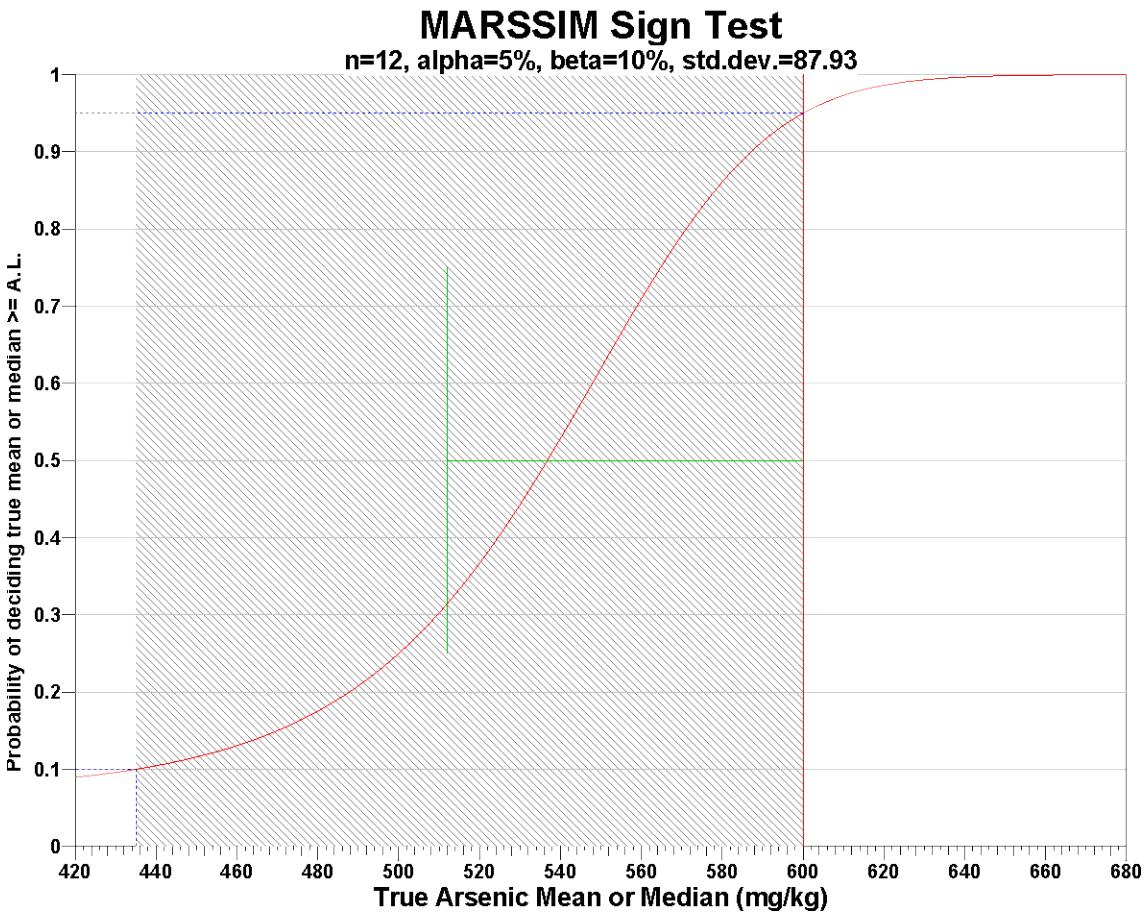
The values of these inputs that result in the calculated number of sampling locations are:

Analyte	**n**[a]	**Parameter**					
		S	**Δ**	**α**	**β**	$Z_{1-\alpha}$ [b]	$Z_{1-\beta}$ [c]
Arsenic	12	87.93 mg/kg	165 mg/kg	0.05	0.1	1.64485	1.28155

[a] The final number of samples has been increased by the MARSSIM Overage of 20%.
[b] This value is automatically calculated by VSP based upon the user defined value of α.
[c] This value is automatically calculated by VSP based upon the user defined value of β.

The following figure is a performance goal diagram, described in EPA's QA/G-4 guidance (EPA, 2000). It shows the probability of concluding the sample area is dirty on the vertical axis versus a range of possible true median(mean) values for the site on the horizontal axis. This graph contains all of the inputs to the number of samples equation and pictorially represents the calculation.

The red vertical line is shown at the threshold (action limit) on the horizontal axis. The width of the gray shaded area is equal to Δ; the upper horizontal dashed blue line is positioned at $1-\alpha$ on the vertical axis; the lower horizontal dashed blue line is positioned at β on the vertical axis. The vertical green line is positioned at one standard deviation below the threshold. The shape of the red curve corresponds to the estimates of variability. The calculated number of samples results in the curve that passes through the lower bound of Δ at β and the upper bound of Δ at $1-\alpha$. If any of the inputs change, the number of samples that result in the correct curve changes.



Statistical Assumptions

The assumptions associated with the formulas for computing the number of samples are:

1. the computed sign test statistic is normally distributed,
2. the variance estimate, S^2, is reasonable and representative of the population being sampled,
3. the population values are not spatially or temporally correlated, and
4. the sampling locations will be selected randomly.

The first three assumptions will be assessed in a post data collection analysis. The last assumption is valid because the sample locations were selected using a random process.

Sensitivity Analysis
The sensitivity of the calculation of number of samples was explored by varying the standard deviation, lower bound of gray region (% of action level), beta (%), probability of mistakenly concluding that $\mu >$ action level and alpha (%), probability of mistakenly concluding that $\mu <$ action level. The following table shows the results of this analysis.

Number of Samples							
AL=600		α=5		α=10		α=15	
		s=175.86	s=87.93	s=175.86	s=87.93	s=175.86	s=87.93
LBGR=90	β=5	183	52	146	41	122	35
	β=10	146	41	112	32	92	27
	β=15	122	35	92	27	74	21
LBGR=80	β=5	52	20	41	16	35	14
	β=10	41	16	32	12	27	10
	β=15	35	14	27	10	21	9
LBGR=70	β=5	28	15	22	12	18	10
	β=10	22	12	17	10	15	8
	β=15	18	10	15	8	11	6

s = Standard Deviation
LBGR = Lower Bound of Gray Region (% of Action Level)
β = Beta (%), Probability of mistakenly concluding that $\mu >$ action level
α = Alpha (%), Probability of mistakenly concluding that $\mu <$ action level
AL = Action Level (Threshold)

Cost of Sampling
The total cost of the completed sampling program depends on several cost inputs, some of which are fixed, and others that are based on the number of samples collected and measured. Based on the numbers of samples determined above, the estimated total cost of sampling and analysis at this site is $7,000.00, which averages out to a per sample cost of $583.33. The following table summarizes the inputs and resulting cost estimates.

COST INFORMATION			
Cost Details	**Per Analysis**	**Per Sample**	**12 Samples**
Field collection costs		$100.00	$1,200.00
Analytical costs	$400.00	$400.00	$4,800.00
Sum of Field & Analytical costs		**$500.00**	**$6,000.00**
Fixed planning and validation costs			$1,000.00
Total cost			**$7,000.00**

Recommended Data Analysis Activities
Post data collection activities generally follow those outlined in EPA's Guidance for Data Quality Assessment (EPA, 2000). The data analysts will become familiar with the context of the problem and goals for data collection and assessment. The data will be verified and validated before being subjected to statistical or other analyses. Graphical and analytical tools will be used to verify to the extent possible the assumptions of any statistical analyses that are performed as well as to achieve a general understanding of the data. The data will be assessed to determine whether they are adequate in both quality and quantity to support the primary objective of sampling.

Because the primary objective for sampling for this site is to compare the site median(mean) value with a threshold value, the data will be assessed in this context. Assuming the data are adequate, at least one statistical test will be done to perform a comparison between the data and the threshold of interest. Results of the exploratory and quantitative assessments of the data will be reported, along with conclusions that may be supported by them.

ATTACHMENT 4:
VSP REPORT FOR THE SILVER KING WASH

Random sampling locations for comparing a median with a fixed threshold (nonparametric - MARSSIM)

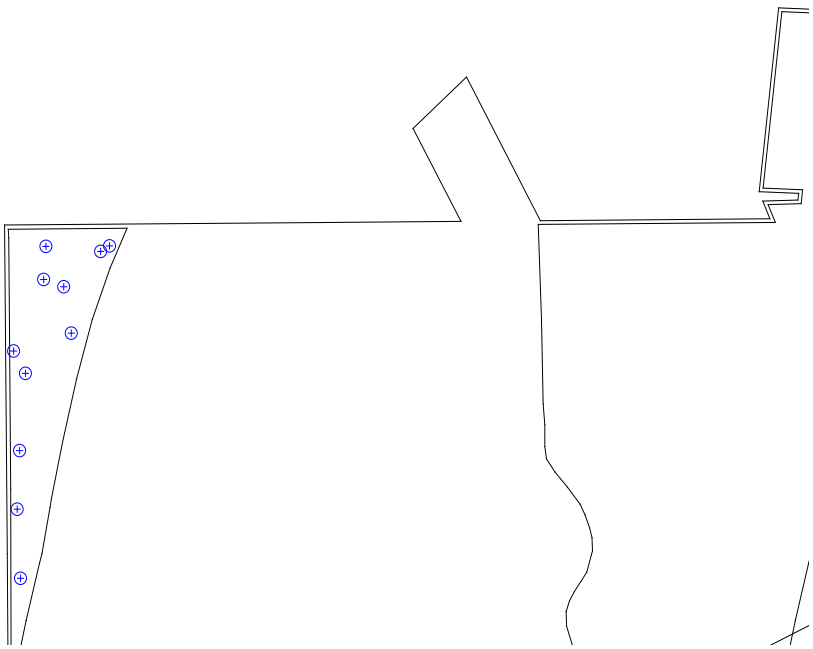
Summary

This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Simple random sampling
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	11
Number of samples on map [a]	11
Number of selected sample areas [b]	1
Specified sampling area [c]	1643627.31 ft^2
Total cost of sampling [d]	$6,500.00

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Including measurement analyses and fixed overhead costs. See the Cost of Sampling section for an explanation of the costs presented here.



Area: Area 1					
X Coord	**Y Coord**	**Label**	**Value**	**Type**	**Historical**
943797.0529	842394.3744			Random	
944272.9640	842619.6562			Random	
944027.4438	841963.3016			Random	
944347.4027	842664.1864			Random	
943575.8346	840550.2768			Random	
943964.1096	842336.0885			Random	
943596.0897	841020.1925			Random	
943815.8880	842659.9819			Random	
943546.2213	841820.1850			Random	
943603.6294	839995.2556			Random	
943644.7411	841640.5603			Random	

Primary Sampling Objective
The primary purpose of sampling at this site is to compare a site median or mean value with a fixed threshold. The working hypothesis (or 'null' hypothesis) is that the median(mean) value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the median(mean) value is less than the threshold. VSP calculates the number of samples required to reject the null hypothesis in favor of the alternative one, given a selected sampling approach and inputs to the associated equation.

Selected Sampling Approach
A nonparametric random sampling approach was used to determine the number of samples and to specify sampling locations. A nonparametric formula was chosen because the conceptual model and historical information (e.g., historical data from this site or a very similar site) indicate that typical parametric assumptions may not be true.

Both parametric and non-parametric equations rely on assumptions about the population. Typically, however, non-parametric equations require fewer assumptions and allow for more uncertainty about the statistical distribution of values at the site. The trade-off is that if the parametric assumptions are valid, the required number of samples is usually less than if a non-parametric equation was used.

Locating the sample points randomly provides data that are separated by many distances, whereas systematic samples are all equidistant apart. Therefore, random sampling provides more information

about the spatial structure of the potential contamination than systematic sampling does. As with systematic sampling, random sampling also provides information regarding the mean value, but there is the possibility that areas of the site will not be represented with the same frequency as if uniform grid sampling were performed.

Number of Total Samples: Calculation Equation and Inputs

The equation used to calculate the number of samples is based on a Sign test (see PNNL 13450 for discussion). For this site, the null hypothesis is rejected in favor of the alternative one if the median(mean) is sufficiently smaller than the threshold. The number of samples to collect is calculated so that if the inputs to the equation are true, the calculated number of samples will cause the null hypothesis to be rejected.

The formula used to calculate the number of samples is:

$$n = \frac{(Z_{1-\alpha} + Z_{1-\beta})^2}{4(SignP - 0.5)^2}$$

where

$$SignP = \Phi\left(\frac{\Delta}{s_{total}}\right)$$

$\Phi(z)$ is the cumulative standard normal distribution on $(-\infty,z)$ (see PNNL-13450 for details),
n is the number of samples,
S_{total} is the estimated standard deviation of the measured values including analytical error,
Δ is the width of the gray region,
α is the acceptable probability of incorrectly concluding the site median(mean) is less than the threshold,
β is the acceptable probability of incorrectly concluding the site median(mean) exceeds the threshold,
$Z_{1-\alpha}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\alpha}$ is $1-\alpha$,
$Z_{1-\beta}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-\beta}$ is $1-\beta$.

Note: MARSSIM suggests that the number of samples should be increased by at least 20% to account for missing or unusable data and uncertainty in the calculated value of n. VSP allows a user-supplied percent overage as discussed in MARSSIM (EPA 2000, p. 5-33).

The values of these inputs that result in the calculated number of sampling locations are:

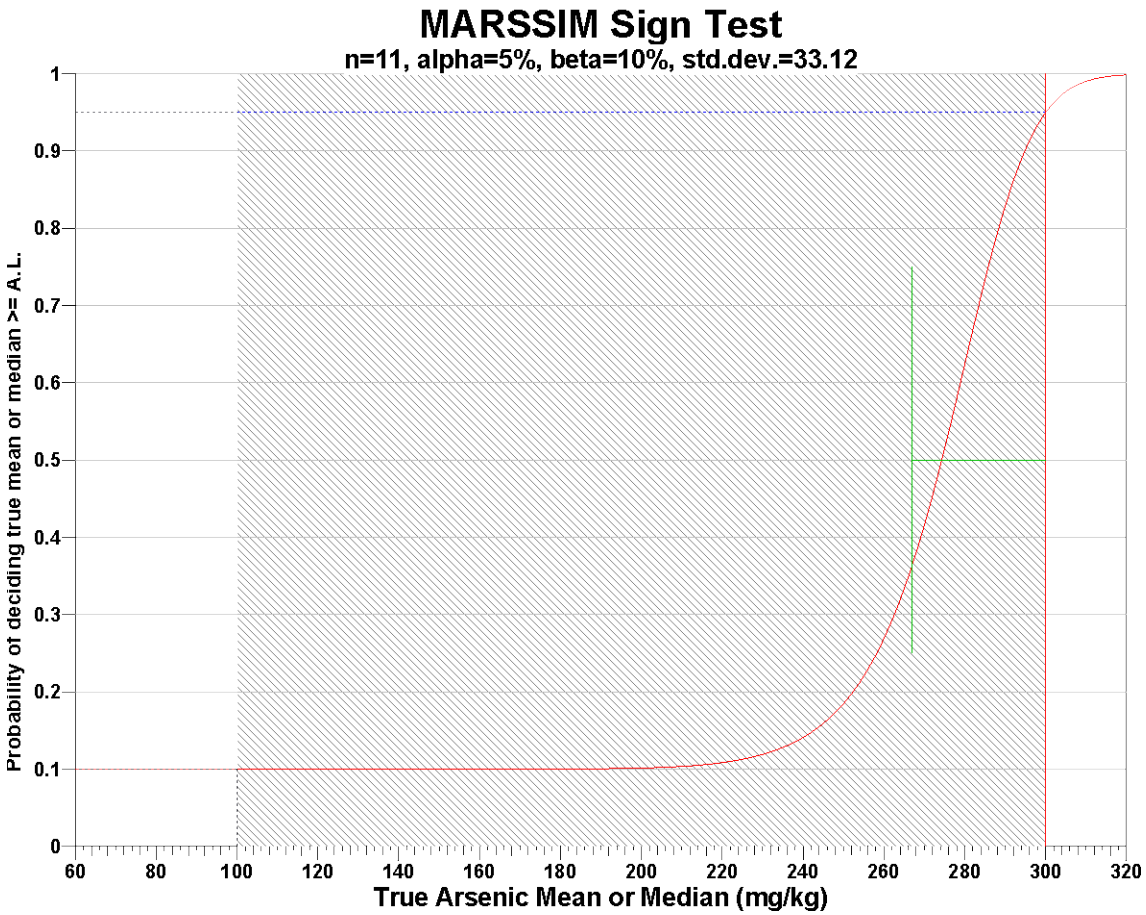
Analyte	n[a]	Parameter					
		S	Δ	α	β	$Z_{1-\alpha}$ [b]	$Z_{1-\beta}$ [c]
Arsenic	11	33.12 mg/kg	200 mg/kg	0.05	0.1	1.64485	1.28155

[a] The final number of samples has been increased by the MARSSIM Overage of 20%.
[b] This value is automatically calculated by VSP based upon the user defined value of α.
[c] This value is automatically calculated by VSP based upon the user defined value of β.

The following figure is a performance goal diagram, described in EPA's QA/G-4 guidance (EPA, 2000). It shows the probability of concluding the sample area is dirty on the vertical axis versus a range of possible true median(mean) values for the site on the horizontal axis. This graph contains all of the inputs to the number of samples equation and pictorially represents the calculation.

The red vertical line is shown at the threshold (action limit) on the horizontal axis. The width of the gray shaded area is equal to Δ; the upper horizontal dashed blue line is positioned at $1-\alpha$ on the vertical axis;

the lower horizontal dashed blue line is positioned at β on the vertical axis. The vertical green line is positioned at one standard deviation below the threshold. The shape of the red curve corresponds to the estimates of variability. The calculated number of samples results in the curve that passes through the lower bound of Δ at β and the upper bound of Δ at 1-α. If any of the inputs change, the number of samples that result in the correct curve changes.



Statistical Assumptions

The assumptions associated with the formulas for computing the number of samples are:

1. the computed sign test statistic is normally distributed,
2. the variance estimate, S^2, is reasonable and representative of the population being sampled,
3. the population values are not spatially or temporally correlated, and
4. the sampling locations will be selected randomly.

The first three assumptions will be assessed in a post data collection analysis. The last assumption is valid because the sample locations were selected using a random process.

Sensitivity Analysis

The sensitivity of the calculation of number of samples was explored by varying the lower bound of gray region (% of action level), beta (%), probability of mistakenly concluding that μ > action level and alpha (%), probability of mistakenly concluding that μ < action level. The following table shows the results of this analysis.

Number of Samples				
AL=300		α=5	α=10	α=15
LBGR=90	β=5	33	27	22
	β=10	27	21	17
	β=15	22	17	14
LBGR=80	β=5	16	12	11
	β=10	12	10	9
	β=15	11	9	6
LBGR=70	β=5	14	11	10
	β=10	11	9	8
	β=15	10	8	6

LBGR = Lower Bound of Gray Region (% of Action Level)
β = Beta (%), Probability of mistakenly concluding that μ > action level
α = Alpha (%), Probability of mistakenly concluding that μ < action level
AL = Action Level (Threshold)

Cost of Sampling
The total cost of the completed sampling program depends on several cost inputs, some of which are fixed, and others that are based on the number of samples collected and measured. Based on the numbers of samples determined above, the estimated total cost of sampling and analysis at this site is $6,500.00, which averages out to a per sample cost of $590.91. The following table summarizes the inputs and resulting cost estimates.

COST INFORMATION			
Cost Details	**Per Analysis**	**Per Sample**	**11 Samples**
Field collection costs		$100.00	$1,100.00
Analytical costs	$400.00	$400.00	$4,400.00
Sum of Field & Analytical costs		**$500.00**	**$5,500.00**
Fixed planning and validation costs			$1,000.00
Total cost			**$6,500.00**

Recommended Data Analysis Activities
Post data collection activities generally follow those outlined in EPA's Guidance for Data Quality Assessment (EPA, 2000). The data analysts will become familiar with the context of the problem and goals for data collection and assessment. The data will be verified and validated before being subjected to statistical or other analyses. Graphical and analytical tools will be used to verify to the extent possible the assumptions of any statistical analyses that are performed as well as to achieve a general understanding of the data. The data will be assessed to determine whether they are adequate in both quality and quantity to support the primary objective of sampling.

Because the primary objective for sampling for this site is to compare the site median(mean) value with a threshold value, the data will be assessed in this context. Assuming the data are adequate, at least one statistical test will be done to perform a comparison between the data and the threshold of interest. Results of the exploratory and quantitative assessments of the data will be reported, along with conclusions that may be supported by them.

At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

Africa	+ 27 11 254 4800
Asia	+ 852 2562 3658
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

solutions@golder.com
www.golder.com

Golder Associates Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052 USA
Tel: (425) 883-0777
Fax: (425) 882-5498

Golder Associates