DEPARTMENT OF
ECOLOGY
State of Washington

Response to Comments

Draft Feasibility Study for Van Stone Mine

Facility Site ID: 1554858
Cleanup Site ID: 461

Public comment period held:

May 22 – June 22, 2017

Summary of a public comment period and responses to comments

August 2017

Publication and Contact Information

This document is available on the Washington State Department of Ecology's website at https://fortress.wa.gov/ecy/gsp/CleanupSiteDocuments.aspx?csid=461.

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Toxics Cleanup in Washington State

Accidental spills of dangerous materials and past business practices have contaminated land and water throughout the state. The Washington State Department of Ecology (Ecology) Toxics Cleanup Program works to remedy these situations, which range from cleaning up contamination from leaking underground storage tanks, to large, complex projects requiring engineered solutions.

Contaminated sites in Washington State are cleaned up under the Model Toxics Control Act (MTCA, Chapter 173-340 Washington Administrative Code), a citizen-mandated law passed in 1989. This law sets standards to ensure toxics cleanup protects human health and the environment and includes opportunities for public input.

Comment Period Summary

Ecology held a comment period from May 22 through June 22, 2017, for the draft *Feasibility Study* for the Van Stone Mine cleanup site.

The study summarizes past investigations of lead and zinc mining-related contamination and emergency cleanup actions already completed. Then final cleanup options are evaluated.

Ecology appreciates the questions and concerns raised in the comments we received from three people, which we address in the Response to Comments section that begins on page 2. After considering the comments, Ecology has made the draft report final without further changes. However, the comments will be taken into consideration as we write the draft cleanup action plan that will be available for public review and comment before becoming final.

Van Stone Mine Background

The site is located 24 miles northeast of Colville off Van Stone Road in Stevens County, Washington.

The Van Stone Mine operated on and off from 1938 to 1993 as an underground and then open-pit lead and zinc mine. Several companies were involved with mining activities at the site over the years, and other companies and individuals have purchased portions of the property.

Due to their activities or ownership of the property, parties potentially responsible for cleanup have included American Smelting and Refining Company (ASARCO), Callahan Mining Corp., Sundown Holdings, Ltd., Equinox Resources Inc., and Vaagen Brothers Lumber, Inc. (Vaagen).

In 2005, ASARCO filed for reorganization under the United States Bankruptcy Code. Ecology filed a claim related to cleaning up Van Stone Mine as part of the ASARCO bankruptcy proceedings. Under the settlement, we received $3.5 million that we have used to investigate the site and complete emergency cleanup actions. Some of this settlement remains to fund cleanup. We have an agreement with Vaagen that allows us to access the site to investigate contamination. The other parties who have had a past interest in the property are no longer viable.

Specific contaminants vary by area, but in general, soil is contaminated with antimony, arsenic, cadmium, lead, mercury, and zinc from mining-related operations. Stormwater discharging into Onion Creek tributaries from tailings piles also contains contaminants requiring cleanup. None of the cleanup options under consideration include surface water treatment; however, by addressing the tailings piles, we stop contaminants from reaching surface waters.

Index of Comments in Order of Date Received

Response to Comments

Comment letters are printed as received (with contact information removed to protect privacy) and numbered below to correspond with the above index of comments. Ecology's responses are *italicized*.

1. Jamie Henneman, Chewelah Independent, received email message June 14

Sent: Wednesday, June 14, 2017 8:44 AM
Subject: Qs on Van Stone Mine cleanup for article

Hello Erika,

I'm working on an article for the Chewelah Independent on the Van Stone Mine cleanup project. I won't be able to make the public meeting tonight but after reviewing the materials available online, I do have a few questions:

*How was the Van Stone mine chosen for cleanup (i.e. what motivated the project? Was is the settlement from the previous owners? Public complaints?)

Ecology's response: *Equinox Resources closed the Van Stone Mine permanently in 1993.*

In the early 2000s, the U.S. Environmental Protection Agency investigated unmanaged mine and mill waste sites all over the upper Columbia River region, judging the risk of mass failures of tailings piles and water quality concerns to be significant.

ASARCO, another previous mine owner, filed bankruptcy in 2005, and Ecology received $3.5 million that we have used to investigate the site and complete emergency cleanup actions. Some of this settlement remains to fund cleanup.

Ecology sent Equinox an early notice letter in 2006, which gave them the option to voluntarily clean up the mining contamination before we made it a formal cleanup site under state management. Equinox made some efforts to address the issues, but they didn't resolve all the problems. No legitimate owner or operator currently exists to lead the cleanup efforts.

Due to the size and complexity of the site, Ecology began the formal cleanup process under MTCA in 2007. We ranked the site hazard as 1 on a scale of 5, with 1 presenting the highest risk, and began fully investigating the contamination and cleanup needs to protect human health and the environment.

In 2012, heavy spring rains and runoff caused water to build up on the upper tailings pile until it overflowed and washed tailings into a tributary to Onion Creek. Ecology completed emergency actions to improve drainage and decrease the slope of the tailings pile to prevent future wash outs. The investigation Ecology directed to determine the full extent and locations of contamination at the mine was completed in 2013.

Cleanup options (which is what the public meeting was about) evaluated in the draft 2017 Feasibility Study include:

- *Limiting public access and posting hazard warnings*
- *Placing restrictions on future property use*
- *Containing waste rock and tailings piles with or without a cover*
- *Centralizing all tailings and dangerous waste into one area and covering it*
- *Disposing of tailings and some waste rock at an offsite landfill*

Following the draft Feasibility Study public comment period May 22 through June 22, 2017, we will consider all input received during the public comment period and revise the Feasibility Study if needed. If substantial changes are made to the draft as a result of public comments, Ecology will hold another comment period.

After the Feasibility Study is final, we will draft a cleanup action plan and present it for public review and comment.

*What kinds of health hazards does the mine pose to the public? What kinds of illnesses can develop from exposure to the materials?

Ecology's response: *Contaminants we are concerned about are antimony, arsenic, cadmium, lead, mercury, and zinc.*

In terms of human health hazards, the risk posed by this mining site is fairly minimal. The biggest concern is children being exposed to lead. Based on our investigation, the most likely scenario for that to occur would be a direct exposure from a person digging in lead-contaminated soil and ingesting the tailings. While its highly unlikely for this to occur, our human health exposure scenarios take this into account.

The Washington Department of Health (DOH) published their Health Consultation: Van Stone Mine, Evaluation of Environmental Exposures, Colville, Stevens County, Washington in September 2014. They summarized their conclusions as follows (page 23):

- *"Physical hazards present on this site could harm people's health.*
- *Touching, breathing, or accidentally ingesting chemical contaminants in soil or sediment at Van Stone Mine is not expected to harm people's health.*
- *Using private well water for drinking and bathing is not expected to harm people's health.*
- *DOH could not conclude whether swimming or wading in surface water at Van Stone Mine could harm people's health.*
- *DOH could not conclude whether naturally-occurring asbestos is present at the site and could harm people's health."*

2. William M. Swartz, received at the public meeting on June 14 at Onion Creek Middle School

Brendan Dowling, site manager
4601 North Monroe Street
Spokane, WA 99205

COMMENT:

DRAFT FEASIBILITY STUDY
VANSTONE MINE
ONION CREEK, WASHINGTON
FACILITY SITE ID: 1554858
CLEAN-UP SITE ID: 461

I, William Swartz and my family have occupied the property to the east and north of Area of Interest 03, since June 10, 1971. I am a geologist by training and was Assistant Exploration Geologist at the Vanstone Mine, with Callahan Mining, 1971-72 and Callahan, Brinex and US Borax, 1974-75. I also have extensive experience in surface water hydrology and water quality; watershed, riparian and wetlands ecology; geomorphology and soils and slope stability over twenty years with the Colville National Forest. The planning instruments with which I have most experience and training are National Environmental Protection Act analyses. I have gained experience in other employment and self-employment construction, mining and forestry.

I would like to suggest four to address in a Final Feasibility Report:

1. An Alternative 4A - There are significant geographic differences between Upper Tailings Pile AOI-2 and the Lower Tailings Pile AOI-3 with respect to ongoing accessibility and surrounding land use. The Lower Tailings Pile AOI-3 would be stabilized and covered as in existing Alternative 4. The Upper Tailings Pile AOI-2 would be stabilized and covered with locally derived soil, without geo-membrane or other imported material. This may reduce reduce cost, decrease construction time and increase the likelihood of timely completion of the project.
2. There is no analysis of the public safety in the area over the East End Fault (which continues to the southwest between the two pits and north of the South Pit). Material perennially raves from this area, into the North Pit. In the analyzed 2,500 year seismic event, is also likely to fail a large amount of material into the West End Pit Lake or otherwise compromise the the West End Pit Dam.
3. The West End Pit Dam was constructed to contain contaminated, meteoric water, during Equinox excavation of the ore body below the preexisting North Pit. The contained water was to never reach full pool, but be pumped to the Mill for process water or in a metered, limited flow into the East Branch, Onion Creek. All future pit activity is foreclosed. Removal or partial removal of the dam would obviate concerns of high wall or east end failure into the lake or dam stability concerns permanently.
4. In all alternatives, Institutional controls must be placed and maintained to protect public safety in the pit areas. As well, title restrictions must be placed on all the areas of interest to limit and regulate surface disturbing land use, and appropriate amendments made to the Stevens County Critical Areas Ordinance.

Respectfully submitted:
William M. Swartz
[redacted]

Ecology's response: *Our responses follow the order of Mr. Swartz's numbered comments.*

1) *While ease of accessibility and land use at the Upper Tailings Pile present some issues, the Emergency Action at the Upper Tailings Pile demonstrated that those issues can be overcome. Regarding your suggestion to use local soil as cover at the Upper Tailings Pile instead of a geomembrane, the cost of that would likely be less than Alternative 4 or 5 (depending on the amount of material needed). However, soil probably would not meet our requirements to protect human health and the environment. The geomembrane proposed in Alternative 4 for the Upper Tailings Pile prevents animals and plants from penetrating the tailings, and mitigates the further spread of contaminants through water runoff and erosion. To meet MTCA requirements, the soil would need to be a minimum of 15 feet deep, which would increase the cost, and the height may not naturally contour into the surrounding land, potentially causing other problems that may need to be addressed in the future.*
2) *We are working with Ecology's Dam Safety Office to ensure the West Pit Lake Dam is compliant with the appropriate regulations and, therefore, protective of human health and safety and the environment.*
3) *We agree that the West End Pit water level was never intended to reach the level that it has. As a result of the amount of water in the West End Pit and the nature of the West End Pit Dam, Ecology's Dam Safety Office has issued a notice of corrective action. An additional inspection of the West End Pit Lake was done in summer 2016, and we recommended that the spillway be upgraded to handle a greater water capacity to help lower the water level in the West End Pit. The Feasibility Study was written to address those concerns. For a summary of findings and required actions from the 2016 inspection, please see the report.*
4) *Agreed. Ecology, where necessary, will be using institutional controls in addition to the on-the-ground cleanup actions to ensure the future health and safety of the public and environment.*

Thank you for reviewing the Feasibility Study and providing thoughtful comments.

3. Earle Olson, received via two email messages sent June 22

Date: June 22, 2017 at 10:05:57 AM PDT
Subject: Van Stone Mine

To Whom It May Concern,

My name is Earle Olson and I am the owner of [property in Colville – address removed to protect privacy] which is a piece of real property immediately adjacent to the tailing pond of the Van Stone Mine.

It has recently come to my attention that there are cleanup and remediation efforts anticipated and/or underway at the Van Stone Mine.

I am deeply concerned about any pollution at this site, as my property is immediately downhill from the site and I have a well. My family and I have spent significant amounts of time at the property and I have always intended retiring there. I would recommend that maximum efforts be undertaken to remediate any pollution at the mine site and/or adjacent to the mine site.

I understand that well testing was conducted in 2011 but I never received any information about this. I would like to have my well tested. I am currently replacing my hot water tank and will retain the old one in case you want to test the sediment that usually accumulates within the tank.

As I am not always at the property, I would prefer that all communications be sent to the following:

Earle Olson
[Contact information removed to protect privacy]

Ecology's response: *Thanks for your comments regarding the Van Stone Mine and your concerns about potential impacts from the mine to your property.*

As a part of the remedial investigation, we looked through our well log database, which includes residential wells. During that review, we created a database of residential wells that were in the vicinity of the Van Stone Mine. Wells put in prior to the early 1990s were not consistently added to this database, as it was not required until that timeframe, and your well may fall into this category as we do not have documentation of it.

Prior to sampling, we contacted local residents who had wells that were in that database to see if they would allow us to sample their well. In addition, we also opened up the sampling to other residents who had concerns.

During that process, we collected groundwater from seven residential wells in addition to several other wells from the mine area that were either installed previously as monitoring wells or during the investigation.

From looking at the map attached to your email (Figure 1) and the map of all of the wells sampled (Figure 2), it appears that we sampled a well (RW-7) that is approximately 700 feet due south of your property. The results from that well did not show contaminant concentrations above screening levels. Table 1 lists the results from all of the groundwater sampling that was collected during the remedial investigation. The results from all the wells do not show any groundwater impacts.

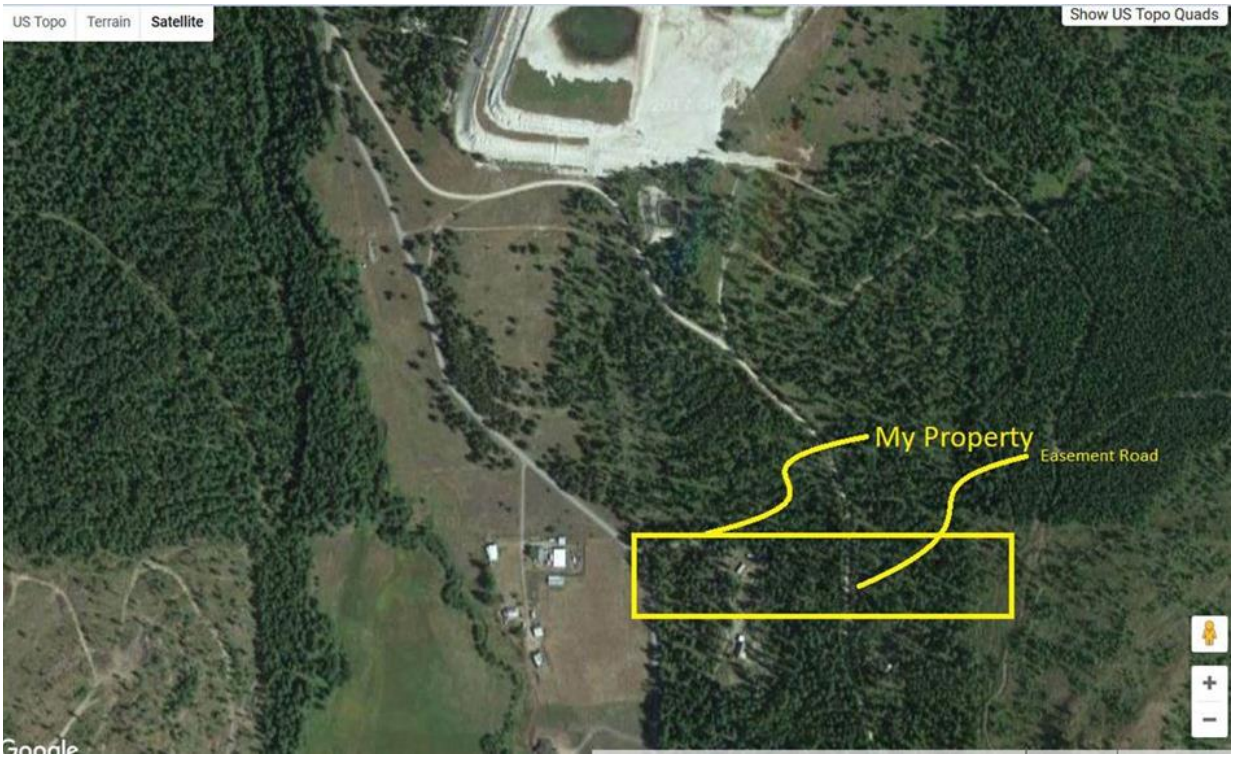

Figure 1. Map attached to Earle Olson's email.

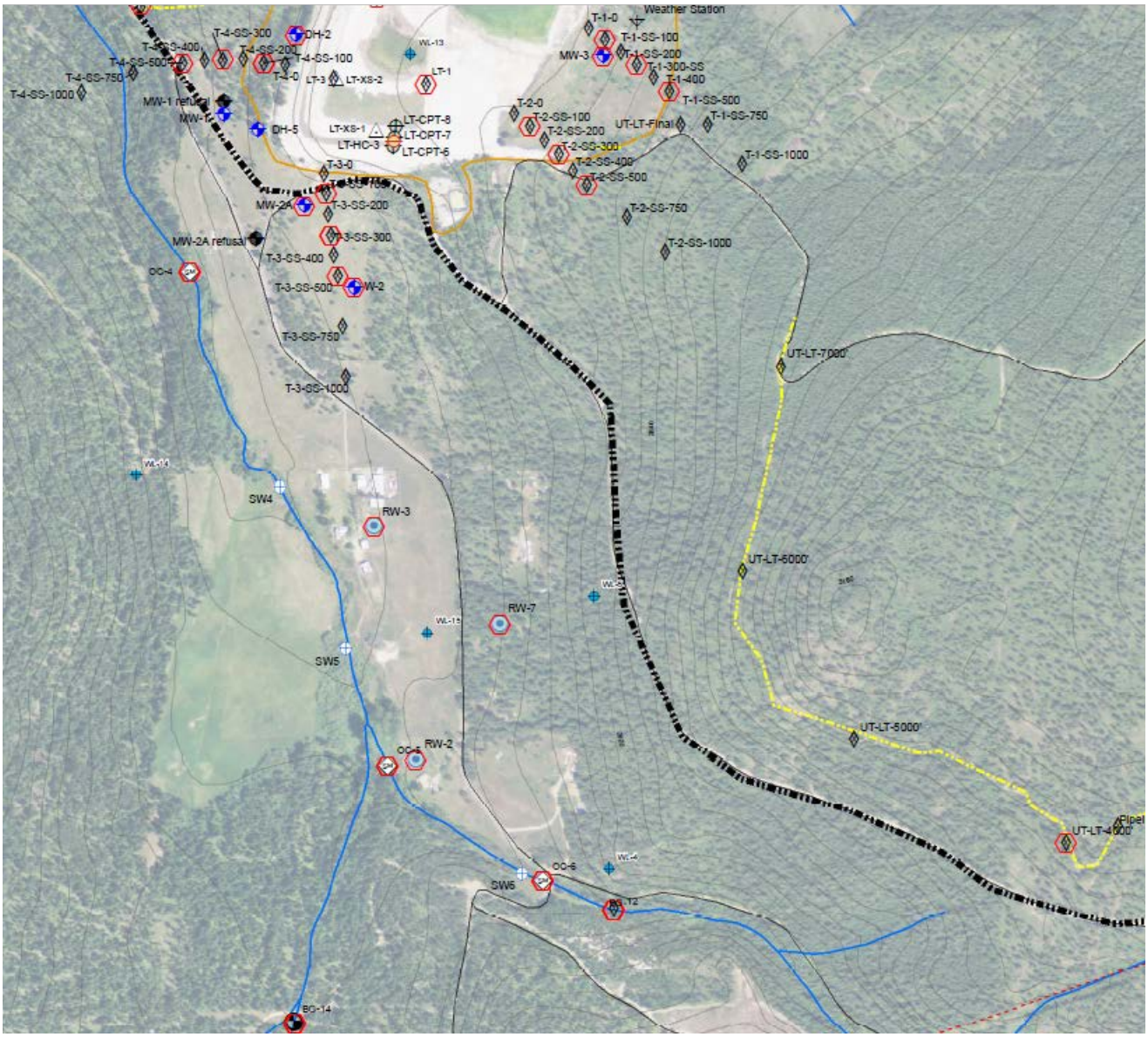

Figure 2. Wells sampled during the remedial investigation.

Table 1. Groundwater sampling results.

Sample ID	Collection Date	General Location	Concentrations in mg/L												
			Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Total Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Groundwater Screening Levels:			**0.006**	**0.0038**	**0.004**	**0.005**	**0.1**	**0.64**	**0.015**	**0.002**	**0.1**	**0.05**	**0.08**	**0.0014**	**4.8**
Residential Wells															
RW-1	11/5/2011	Residential Well Sample	0.0004 U	0.0038 U	0.00051 U	0.00014 U	0.0014 U	0.00055 U	0.0053	0.000041 U	0.002 U	0.0036 U	0.00015 U	0.0014 U	0.1
RW-2	11/6/2011	Residential Well Sample	0.0004 U	**0.0053**	0.00051 U	0.00014 U	0.0014 U	0.00065 T	0.00017 U	0.000041 U	0.002 U	0.0036 U	0.00015 U	0.0014 U	0.013
RW-3	11/6/2011	Residential Well Sample	0.0004 U	0.0038 U	0.00051 U	0.00014 U	0.0014 U	0.0044 T	0.00025 T	0.000041 U	0.002 U	0.0036 U	0.00015 U	0.0014 U	0.074
RW-4	11/9/2011	Residential Well Sample	0.0004 U	0.0038 U	0.00051 U	0.00014 U	0.0015 T	0.0032 T	0.00025 T	0.000041 U	0.002 U	0.0036 U	0.00015 U	0.0014 U	0.024
RW-5	11/10/2011	Residential Well Sample	0.0004 U	0.0038 U	0.00051 U	0.00014 U	0.0014 U	0.034	0.0016 T	0.000041 U	0.002 U	0.0036 U	0.00015 U	0.0014 U	0.045
RW-50	11/10/2011	Field Duplicate of RW-5	0.0005 T	0.0038 U	0.00051 U	0.00014 T	0.0014 U	0.02	0.00086 T	0.000041 U	0.002 U	0.0036 U	0.00015 U	**0.0015 T**	0.019
RW-6	11/11/2011	Residential Well Sample	0.0004 U	0.0038 U	0.00051 U	0.00014 U	0.0014 U	0.0024 T	0.00017 U	0.000041 U	0.002 U	0.0036 U	0.00015 U	0.0014 U	0.28
RW-7	11/11/2011	Residential Well Sample	0.0004 U	0.0038 U	0.00051 U	0.00014 U	0.0014 U	0.0073	0.0016 T	0.000041 U	0.002 U	0.0036 U	0.00015 U	0.0014 U	1.2
Monitoring Wells															
AOI-2: Upper Tailings Pile															
MW-4	11/11/2011	Monitoring Well Sample	0.0004 U	0.0038 U	0.00051 U	0.00015 T	0.0039	0.0077	0.0042	0.000041 U	0.0041 T	0.0036 U	0.00015 U	0.0014 U	0.041
MW-5	11/11/2011	Monitoring Well Sample	0.0004 U	0.0038 U	0.00051 U	0.0014 T	0.016	0.0061	0.0027	0.000041 U	0.014 T	0.0036 U	0.0014 T	0.0014 U	0.026
AOI-3: Lower Tailings Pile															
MW-2	11/9/2011	Monitoring Well Sample	0.00053 T	0.0038 U	0.00081 T	0.00062 T	**0.47**	0.048	0.0075	0.00015 T	**0.31**	0.0036 U	0.042	0.0014 U	0.13
MW-3	11/10/2011	Monitoring Well Sample	0.0004 U	0.0038 U	0.0018 T	0.00015 T	0.086	0.032	0.011	0.00056	0.05	0.0036 U	0.0014 T	**0.0014 T**	0.26
DH-2[a]	11/8/2011	Monitoring Well Sample	**0.028**	**0.015**	0.00055 T	**0.0095**	0.016	0.021	**0.22**	0.00016 T	0.028	0.0036 U	0.00015 U	0.0014 U	0.39
W-1[a]	11/10/2011	Monitoring Well Sample, DH-8	0.00075 T	0.0038 U	0.00051 U	0.0007 T	0.017	0.0093	0.011	0.000041 U	0.011 T	0.0036 U	0.0005 T	0.0014 U	0.044
W-2[a]	11/9/2011	Monitoring Well Sample, W2	0.0009 T	0.0038 U	0.00051 U	0.00053 T	0.0031	0.0033 T	**0.015**	0.000041 U	0.002 U	0.0036 U	0.00021 T	0.0014 U	0.044

Sample ID	Collection Date	General Location	Concentrations in mg/L						
			Hardness as CaCO3	Total Dissolved Solids	Total Suspended Solids	Alkalinity as Bicarbonate	Alkalinity as Carbonate	Alkalinity as Hydroxide	Total Alkalinity
Residential Wells									
RW-1	11/5/2011	Residential Well Sample	150	160	20 U	150	5 U	5 U	150
RW-2	11/6/2011	Residential Well Sample	240	270	20 U	240	5 U	5 U	240
RW-3	11/6/2011	Residential Well Sample	250	290	20 U	250	5 U	5 U	250
RW-4	11/9/2011	Residential Well Sample	260	340	10 U	250	5 U	5 U	250
RW - 5	11/10/2011	Residential Well Sample	250	300	10 U	230	5 U	5 U	230
RW - 50	11/10/2011	Field Duplicate of RW-5	250	330	10 U	230	5 U	5 U	230
RW - 6	11/11/2011	Residential Well Sample	65	120	10 U	83	5 U	5 U	83
RW-7	11/11/2011	Residential Well Sample	320	380	10 U	310	5 U	5 U	310
Monitoring Wells									
AOI-2: Upper Tailings Pile									
MW-4	11/11/2011	Monitoring Well Sample	1200	2000	69	230	5 U	5 U	230
MW-5	11/11/2011	Monitoring Well Sample	520	830	120	170	5 U	5 U	170
AOI-3: Lower Tailings Pile									
MW-2	11/9/2011	Monitoring Well Sample	1500	2200	620	320	5 U	5 U	320
MW-3	11/10/2011	Monitoring Well Sample	590	450	1500	230	5 U	5 U	230
DH-2[a]	11/8/2011	Monitoring Well Sample	1800	2300	4000	200	5 U	5 U	200
W-1[a]	11/10/2011	Monitoring Well Sample, DH-8	920	2000	48	240	5 U	5 U	240
W-2[a]	11/9/2011	Monitoring Well Sample, W2	310	420	150	200	5 U	5 U	200

Notes:
Metal results, with the exception of Total Mercury, are reported from the total recoverable fraction.
(a) Monitoring wells were installed prior to the Remedial Investigation.

U = Not detected at reporting limit indicated
T = Value is between the MDL and MRL

Location	Sample ID	Date	Metals[2]							
			Antimony	Arsenic	Cadmium	Calcium	Lead	Magnesium	Nickel	Thallium
			µg/L							
Cleanup Level[3,4]			6	5	5	NE	15	NE	100	2
DH-2 (DH89-2)	DH-2-101415	10/14/2015	3.0 U[5]	4.0 U[5]	**4.2**	**333,000**	10.0 U	**320,000**	20.0 U	5.0 U[5,6]
	DH-2:020116	02/01/2016	0.15 U	**1.1**	**3.3**	**350,000**	**2.7**	**341,000**	**8.0**	0.10 U
Duplicate (MW-2)	DUP-1-101515	10/15/2015	3.0 U[5]	4.0 U[5]	3.0 U	**335,000**	10.0 U	**110,000**	20.0 U	5.0 U[5,6]
	DUP: 020116	02/01/2016	0.15 U	**1.4**	**0.13**	**355,000 M1**	0.98	**121,000 M1**	**1.0**	0.10 U
MW-1	MW-1: 020116	02/01/2016	0.15 U	**2.0**	0.080 U	**92,000**	**0.34**	**20,600**	**0.68**	0.10 U
MW-2	MW-2-101515	10/15/2015	3.0 U[5]	4.0 U[5]	3.0 U	**343,000**	10.0 U	**112,000**	20.0 U	5.0 U[5,6]
	MW-2: 020116	02/01/2016	0.15 U	**1.4**	**0.10**	**345,000**	**0.99**	**117,000**	**1.0**	0.10 U
MW-3	MW-3-101415	10/14/2015	3.0 U[5]	4.0 U[5]	3.0 U	**80,400**	10.0 U	**20,600**	20.0 U	5.0 U[5,6]
	MW-3: 020216	02/02/2016	0.15 U	0.50 U	0.080 U	**88,800**	0.10 U	**23,800**	0.50 U	0.10 U
MW-5	MW-5-101515	10/15/2015	3.0 U[5]	4.0 U[5]	3.0 U	**121,000**	10.0 U	**46,900**	20.0 U	5.0 U[5,6]
	MW-5: 020216	02/02/2016	0.15 U	**1.4**	**3.5**	**104,000**	**3.9**	**39,900**	**7.3**	0.10 U
W-1 (DH89-8 or DH-8)	W1-101415	10/14/2015	3.0 U[5]	4.0 U[5]	3.0 U	**185,000 M1**	10.0 U	**149,000 M1**	20.0 U	5.0 U[5,6]
	W1: 020116	02/01/2016	**0.65**	**0.68**	**0.45**	**197,000**	**0.64**	**161,000**	**1.1**	0.10 U
W-2	W-2-101415	10/14/2015	3.0 U[5]	4.0 U[5]	3.0 U	**88,900**	10.0 U	**20,000**	20.0 U	5.0 U[5,6]

Notes:

[1]Chemical analysis conducted by Pace Analytical located in Minneapolis, Minnesota.

[2]Metals analyzed by EPA Method 6020A.

[3]Model Toxics Control Act (MTCA) Method A and B cleanup levels. Method B cleanup levels are referenced from Ecology's CLARC Master Spreadsheet. When compounds have multiple cleanup levels referenced in CLARC (carcinogenic and non-carcinogenic), the most conservative value is displayed.

[4]Cleanup levels adapted from lowest potential groundwater ARAR listed in Table 14 from Hart Crowser Remedial Investigation.

[5]Result reported down to the method detection limit (MDL).

[6]MDL is greater than the applicable cleanup level (CUL).

'--' = not tested; U = Analyte was not detected above reporting limit; µg/L = micrograms per liter; NE = not established; NL = indicates that a value (Method A or B) is available, but was not selected as the project cleanup level; M1 = Matrix spike recovery exceeded quality control limits. Batch accepted based on laboratory control (LCS) recovery.

Bold indicates analyte was detected above the reporting limit.

Location	Sample Name	Date	Alkalinity as $CaCO_3$ [2]	Total Dissolved Solids [3]	Total Suspended Solids [4]	Hardness as $CaCO_3$ [5]
			mg/L	mg/L	mg/L	µg/L
DH-2	DH-2-101415	10/14/2015	**328**	**3,000**	**12.0**	**2,150,000**
	DH-2: 020116	02/01/2016	**313**	**3,020**	**17.0**	**2,280,000**
Duplicate (MW-2)	DUP-1-101515	10/15/2015	**323**	**1,960**	**135**	**1,290,000**
	DUP: 020116	02/01/2016	**302**	**1,800**	**31.0**	**1,380,000**
MW-1	MW-1: 020116	02/01/2016	**145**	**413**	10.0 U	**315,000**
MW-2	MW-2-101515	10/15/2015	**321**	**1,970**	**145**	**1,320,000**
	MW-2: 020116	02/01/2016	**301**	**1,780**	**27.0**	**1,340,000**
MW-3	MW-3-101415	10/14/2015	**223**	**409**	10.0 U	**286,000**
	MW-3: 020216	02/02/2016	**210**	**410**	10.0 U	**320,000**
MW-5	MW-5-101515	10/15/2015	**155**	**692**	**200**	**494,000**
	MW-5: 020216	02/02/2016	**152**	**653**	**190**	**424,000**
W-1	W1-101415	10/14/2015	**244**	**1,520**	10.0 U	**1,070,000**
	W1: 020116	02/01/2016	**244**	**1,500**	10.0 U	**1,160,000**
W-2	W-2-101415	10/14/2015	**218**	**412**	10.0 U	**304,000**

Notes:

[1]Chemical analysis conducted by Pace Analytical located in Minneapolis, Minnesota.

[2]Alkalinity as calcium carbonate ($CaCO_3$) was analyzed by EPA Method 2320B.

[3]Total Dissolved Solids was analyzed by EPA Method SM2540C.

[4]Total Suspended Solids analyzed by EPA Method SM2540D.

[5]Hardness as CaCO3 was analyzed by EPA Method 6010C.

mg/L = milligrams per liter; µg/L = milligrams per liter; U = analyte was not detected above reporting limit.

Bold indicates analyte was detected above the laboratory reporting limit.

Sent: Thursday, June 22, 2017 10:30 AM
Subject: Additional Information regarding [property in Colville – address removed to protect privacy]

Hi Erika,

I forgot to mention in my first email that my property is bisected by an easement road that leads from the van stone mine tailing pond directly to the mine itself. This road was used extensively by the mine to move dirt and things to the tailing pond.

I am particularly concerned about the dust that has been, and will be, kicked up from this road. I clearly recall that during the summer my property was coated with dust from the use of this road.

The following map shows the outline (roughly) of my property and the location of the easement road from the tailing pond to the mine.

Thank you, Earle Olson

Ecology's response: *Concerns about dust blowing from the tailings piles and the roads has been something that we have heard on numerous occasions and worked to mitigate.*

As a result of comments received at the public meeting for the work plan to conduct the remedial investigation, we added additional sampling to address those concerns. Fifteen soil samples were collected from along the road that leads from the school to the actual mine workings area. Table 2 describes where those samples were collected along with any visual observations that were noted at the time of sampling. Table 3 provides the analytical results of the sampling.

In addition, a series of soil samples were collected in a southerly line leading from the lower tailings pile in the general direction of your property. The results from those samples indicate that the contamination greatly drops off as you move away from the tailings pile to the point where, within 500 feet of the tailings pile, contaminants are not found above screening levels.

Hopefully, these responses address your concerns about potential impacts to your property. If you additional concerns, please feel free to contact us.

Table 2. Soil samples taken from along the road.

Sample ID	Collection Date	Visual Soil Description	General Location	Observations	Evidence of Mine Impacts
DR-1	6/25/2012	Moist, gray-black, slightly silty, gravelly SAND (SW)	Van Stone-Onion Road between junction with Van Stone Mine Road and County Highway 9425	No evidence of surface road weathering, road base appears to be different material than Van Stone Mine Road	No evidence of waste rock or tailings observed
DR-2	6/25/2012	Moist, gray-black, slightly silty, gravelly SAND (SW)	Van Stone-Onion Road between junction with Van Stone Mine Road and County Highway 9425	No evidence of surface road weathering, road base appears to be different material than Van Stone Mine Road	No evidence of waste rock or tailings observed
DR-3	6/25/2012	Wet, gray-black, slightly silty, gravelly SAND (SW)	Van Stone-Onion Road slightly north of junction with Van Stone Mine Road	No evidence of surface road weathering, road base appears to be different material than Van Stone Mine Road	No evidence of waste rock or tailings observed
DR-4	6/25/2012	Wet, tan-brown, slightly silty, gravelly SAND (SW)	Van Stone Mine Road slightly south of junction with Van Stone-Onion Road	Surface road erosion in ruts	No evidence of waste rock or tailings observed
DR-5	6/25/2012	Wet, gray-black, slightly silty, gravelly SAND (SW)	Van Stone-Onion Road south of Lower Tailings Pile and junction of Van Stone-Onion Road and Van Stone Mine Road	No evidence of surface road weathering, road base appears to be different material than Van Stone Mine Road	No evidence of waste rock or tailings observed
DR-6	6/25/2012	Wet, tan-brown, slightly silty, gravelly SAND (SW)	Van Stone Mine Road between Upper Tailings Pile Road and Lower Tailings Pile Road, slightly south of Lower Tailings Pile Road.	Surface road erosion	No evidence of waste rock or tailings observed
DR-7	6/25/2012	Wet, tan-brown, slightly silty, gravelly SAND (SW)	Van Stone Mine Road between Upper Tailings Pile Road and Lower Tailings Pile Road	Minor surface road erosion in ruts	No evidence of waste rock or tailings observed
DR-8	6/25/2012	Wet, tan-brown, silty SAND with trace gravel (SM)	Van Stone Mine Road between Upper Tailings Pile Road and Lower Tailings Pile Road	Limited surface road erosion in ruts	No evidence of waste rock or tailings observed
DR-9	6/25/2012	Wet, tan-brown, silty SAND (SM)	Van Stone Mine Road. Between Upper Tailings Pile Road and Lower Tailings Pile Road.	No evidence of surface road erosion	No evidence of waste rock or tailings observed
DR-10	6/25/2012	Wet, tan-brown, silty SAND with trace gravel (SM)	Van Stone Mine Road between Upper Tailings Pile Road and Lower Tailings Pile Road		No evidence of tailings observed, some pieces of waste rock observed on shoulders of the road
DR-11	6/25/2012	Wet, tan-brown, silty SAND with trace gravel (SM)	Van Stone Mine Road along bend where road shifts from southeast to northeast	Very minor surface road erosion	No evidence of waste rock or tailings observed
DR-12	6/25/2012	Wet, tan-brown, slightly silty, gravelly SAND (SW)	Van Stone Mine Road between Mine Site and Upper Tailings Pile Road	Some surface road erosion in main ruts	No evidence of tailings observed, several pieces of waste rock and native bedrock mixed in with the road base

Sample ID	Collection Date	Visual Soil Description	General Location	Observations	Evidence of Mine Impacts
DR-13	6/25/2012	Wet, tan-brown, slightly silty, gravelly SAND (SW)	Van Stone Mine Road between Mine Site and Upper Tailings Pile Road	Limited surface road erosion in main ruts	No evidence of tailings observed, several large pieces of waste rock observed on side of the road
DR-14	6/25/2012	Wet, tan-brown, slightly silty, gravelly SAND (SW)	Van Stone Mine Road at Y-intersection where Van Stone Mine Road forks to east, below gate to Burris residence and Van Stone Mine	Surface road erosion	No evidence of waste rock or tailings observed
DR-15	6/25/2012	Wet, brown, slightly silty, gravelly SAND (SW)	Van Stone Mine Road below gate to Van Stone Mine	Surface road erosion	No evidence of waste rock or tailings observed

Table 3. Roadside sample results.

Sample ID	Collection Date	General Location	Concentrations in mg/Kg												
			Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
		Surface Soil Screening Levels:	0.86	5.04	1.4	1.6	26	28	44.9	0.13	30	1.65	2	1	206
Background Sample															
BG-1-SS	10/6/2011	Background Sample	0.51	3.9	0.41 T	1.3	9.6	20	11	0.075	7.5	**2.3**	0.1 T	0.26 U	48
BG-2-SS	10/4/2011	Background Sample	0.31	4.4	0.33	0.4	5	6.2	12	0.052	3.7	0.87	0.062 T	0.17 T	23
BG-3-SS	10/6/2011	Background Sample	**1**	4.6	0.71	0.81	16	10	39	**0.15**	8	**2.3**	0.15 T	0.17 T	30
BG-4-SS	10/6/2011	Background Sample	0.73	2.4	0.47	0.42	7.2	6.7	21	0.082	6.1	0.88 T	0.069 T	0.2 T	25
BG-5-SS	10/5/2011	Background Sample	0.29	3.6	0.73	**1.8**	9.9	2.9	19	0.043	8.1	0.68 T	0.057 T	0.14 U	**390**
BG-6-SS	10/4/2011	Background Sample	0.49	4.3	0.78	0.86	15	6.3	36	0.11	11	0.96	0.12 T	0.2 T	90
BG-7-SS	10/4/2011	Background Sample	0.22	2.1	0.47	0.26	15	2.9	15	0.034	10	0.45 T	0.056 T	0.14 U	52
BG-8-SS	10/3/2011	Background Sample	0.16 JT	1.8	0.46	0.25	6.2	2.5	9.6	0.023	4.4	0.64 T	0.03 T	0.15 T	69
BG-9-SS	10/7/2011	Background Sample	0.37 J	4.3	0.58	0.56	12	7.4	26	0.11	13	1.3	0.12 T	0.23 T	60
BG-9-SS2	10/7/2011	Field duplicate of BG-9-SS	0.33 J	4.2	0.5	0.5	12	6.9	22	0.1	13	1.2	0.099 T	0.22 T	53
BG-10-SS	10/5/2011	Background Sample	**1**	3	0.27 T	**3.1**	4.7	14	**45**	0.12	3.7	0.71 T	0.082 T	0.22 U	**660**
BG-11-SS	10/8/2011	Background Sample	0.14 T	2.2	0.47	0.2 T	13	3.6	11	0.038	9.6	0.64 T	0.04 T	0.16 T	51
BG-13-SS	10/5/2011	Background Sample	0.64	5.2	0.54	0.37	11	6.1	42	0.088	14	0.96	0.065 T	0.15 U	37
BG-14-SS	10/6/2011	Background Sample	0.32	2.6	0.28	0.28	7.9	4	13	0.024	7.4	0.49 T	0.043 T	0.15 T	36
BG-15-SS	10/7/2011	Background Sample	0.22 T	3.7	0.31	0.56	10	5.4	38	0.06	8.3	0.73 T	0.056 T	0.16 T	140
AOI-1: Mill Facility, Open Pits, and Waste Rock															
NP-1-SS	10/14/2011	Mine Site Sample		**10**		**7.4**		6.8	**500**						**1700**
NP-3-SS	10/14/2011	Mine Site Sample		**7.1**		**120**		**48**	**22000**						**36000**
T11-SS-300	11/2/2011	XRF Transect 11 at 300 feet	**2.6**	**9.6**	0.19 U	**5.5**	2.1	**31**	**190**	0.081	2.4	0.19 U	0.11 T	0.15 T	**1400**
T11-SS-900	11/2/2011	XRF Transect 11 at 900 feet	0.47	3	0.46	0.44	6.3	6.9	23	0.032	5.8	0.24 T	0.049 T	0.14 U	**360**
T11-SS-1200	11/2/2011	XRF Transect 11 at 1200 feet	0.2 T	2.8	0.55	0.31	7.2	4.6	21	0.041	6.9	0.24 U	0.025 T	0.15 U	150
T12-SS-150	11/8/2011	XRF Transect 12 at 150 feet	0.31	3.6	0.37	0.39	4.7	0.89 T	9.3	0.028	4.4	0.23 U	0.03 T	0.15 U	75
T12-SS-450	11/8/2011	XRF Transect 12 at 450 feet	0.72	4.2	0.48	**2.4**	9.5	2.4	**120**	0.06	6.9	0.48 T	0.064 T	0.24 T	**610**
T12-SS-750	11/2/2011	XRF Transect 12 at 750 feet	0.33	2.4	0.22 T	0.38	6.5	1.1	18	0.015 T	4.4	0.23 U	0.036 T	0.15 U	120
T13 SS-150	10/31/2011	XRF Transect 13 at 150 feet	**1.2**	3.4	0.46	0.64	6.9	5.2	16	0.05	6.8	0.32 T	0.037 T	0.21 T	110
T13-SS-300	10/31/2011	XRF Transect 13 at 300 feet	**0.92**	3.1	0.47	0.31	5.7	7	19	0.05	6.2	0.4 T	0.056 T	0.17 T	78
T13-SS-500	10/31/2011	XRF Transect 13 at 500 feet	0.19 T	2.4	0.47	0.45	5.4	6.5	16	0.037	5.7	0.28 T	0.047 T	0.16 U	99
T14-SS-300	11/7/2011	XRF Transect 14 at 300 feet	0.32	2	0.27	**4.7**	3.6	15	**240**	0.09	2.5	0.28 T	0.062 T	0.13 U	**2100**
T14-SS-500	11/7/2011	XRF Transect 14 at 500 feet	0.37	4.1	0.52	**2.4**	6.2	13	34	0.073	6.5	0.29 T	0.087 T	0.16 T	**960**
T14-SS-750	11/7/2011	XRF Transect 14 at 750 feet	0.099 T	1.9	0.43	0.3	5.4	4.3	6.7	0.027	4.8	0.21 U	0.049 T	0.14 U	51
T15-SS-200	11/1/2011	XRF Transect 15 at 200 feet	0.18 JT	2.1	0.44	**3.7**	4.7	5	**88**	**0.15 J**	4	0.41 T	0.073 T	0.2 T	**1300**
T15-SS-750	11/1/2011	XRF Transect 15 at 750 feet	0.29	2.6	0.52	0.66	6.2	5.3	21	0.041	6.6	0.25 T	0.041 T	0.24 T	**220**
T15-SS-1000	11/1/2011	XRF Transect 15 at 1000 feet	0.18 T	2.6	0.59	0.47	11	8.3	22	0.039	7.9	0.47 T	0.055 T	0.19 T	99
T15-SS-1020	11/1/2011	Field duplicate of T15-SS-1000	0.36	2.9	0.47	0.62	8.1	4.4	17	0.03	6.3	0.42 T	0.056 T	0.16 T	89
T16-SS-0	6/21/2012	Transect 16 at 0 feet	**0.92**	**5.6**	1.1 U	1.5	6 U	17 U	**48**	0.034	15 U	0.33 T	0.044 T	0.2 U	**270**
T16-SS-315	6/21/2012	Transect 16 at 315 feet	**1**	3.3	1.1 U	0.94	6.1 U	28 U	**77**	0.061	16 U	0.37 T	0.036 T	0.2 U	130
T16-SS-770	6/21/2012	Transect 16 at 770 feet	0.23 T	1.6	0.84 U	0.21 T	5 T	8.5 U	18	0.018 T	22	0.24 U	0.032 T	0.15 U	37
T17-SS-0	6/21/2012	Transect 17 at 0 feet	0.49	4.7	0.87 U	0.76	4.8 U	15 U	**95**	0.039	12 U	0.31 T	0.086 T	0.16 U	**250**
T17-SS-500	6/21/2012	Transect 17 at 500 feet	0.31	3.2	1 U	0.3	5.7 U	18 U	9.5 T	0.052	15 U	0.3 U	0.073 T	0.19 U	71
T18-SS-0	6/21/2012	Transect 18 at 0 feet	0.37	4	1.1 T	0.61	5.7 T	17 U	26	0.042	17 U	0.41 T	0.066 T	0.18 U	140
T18-SS-350	6/21/2012	Transect 18 at 350 feet	0.56	3.1	0.94 U	0.4	5.1 U	16 U	29	0.032	13 U	0.32 T	0.081 T	0.17 U	120
MS-1	6/20/2012	Mine Site Mill Area Stained Soil	**8.8**	**6.2**	0.76 U	**8.9**	10 T	**52 J**	**840**	0.12	7.3 T	0.36 T	0.22	0.18 T	**3700**
MS-2	6/20/2012	Mine Site Mill Area Stained Soil	**1.4**	**5.2**	0.65 U	**5.6**	3.6 U	6.6 U	**380**	**0.15**	2.8 T	0.22 T	0.16 T	0.18 T	**1700**
MS-3	6/20/2012	Mine Site Mill Area Stained Soil	**20**	**9.3**	0.84 U	**22**	8.4 T	**130**	**2600**	0.079	13	0.43 T	0.64	0.15 U	**12000**
MS-4	6/20/2012	Mine Site Mill Area Stained Soil	**5.3**	**17**	0.62 U	**50**	7.7 T	**58**	**4500**	**0.45**	9.1	0.36 T	0.66	0.3 T	**11000**
MS-5	6/20/2012	Mine Site Mill Area Stained Soil	**4.6**	**6.6**	0.64 U	**31**	21	**70**	**3100**	**0.5**	**45**	0.54 T	0.46	0.3 T	**8200**
MS-6	6/20/2012	Mine Site Mill Area Stained Soil	**15 J**	**11 J**	0.65 UJ	**180 J**	5.5 JT	**360 J**	**26000 J**	**2.8 J**	1.2 UJ	0.77 J	**3.3 J**	**1.3 J**	**23000 J**
MS-7	6/20/2012	Mine Site Mill Area Stained Soil	**3.3 J**	**7.9 J**	0.57 UJ	**47 J**	3.1 UJ	**640 J**	**3900 J**	0.36 J	1.5 JT	0.31 JT	0.56 J	0.3 JT	**9700 J**
MS-8	6/20/2012	Mine Site Mill Area Stained Soil	**15 J**	**8.8 J**	0.67 UJ	**46 J**	3.7 UJ	**75 J**	**21000 J**	**0.17 J**	1.2 UJ	0.5 JT	**3.4 J**	**1.2 J**	**9400 J**
MS-9	6/20/2012	Mine Site Mill Area Stained Soil	**11**	**7.7**	0.65 U	**19**	**35**	**59**	**2500**	**0.16**	23	0.55 T	0.59	0.3 T	**4300**
MS-10	6/20/2012	Mine Site Mill Area Stained Soil	**1.3**	4.2	1.2 T	**3.4**	6.5 T	7.2 T	**530**	**0.13**	7.8 T	0.57 T	0.43	0.32 T	**1100**
MS-11	6/21/2012	Waste Rock Erosional Area	0.19	2.3	0.69 U	0.19	3.8 U	17 UJ	24 J	0.0058 T	9.7 U	0.21 T	0.02 T	0.13 U	64 J

Sample ID	Collection Date	General Location	Concentrations in mg/Kg												
			Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
		Surface Soil Screening Levels:	**0.86**	**5.04**	**1.4**	**1.6**	**26**	**28**	**44.9**	**0.13**	**30**	**1.65**	**2**	**1**	**206**
MS-12	6/21/2012	Waste Rock Erosional Area	0.1 T	1.2	0.8 U	1.3	4.8 T	12 U	8.9 T	0.013 T	1.5 U	0.31 T	0.029 T	0.15 U	**300**
MS-13	6/21/2012	Waste Rock Erosional Area	0.28	3.2	1.1 T	0.45	4.4 U	14 U	12 T	0.016 T	11 U	0.83	0.032 T	0.15 U	48
MS-14	6/21/2012	Waste Rock Erosional Area	0.32	2.2	0.98 U	0.25 T	5.4 U	14 U	9.1 T	0.035	14 U	0.38 T	0.049 T	0.18 U	41
MS-15	6/21/2012	Waste Rock Erosional Area	**2.6**	**8.1**	0.77 U	**21**	4.2 U	23 U	**980**	**0.51**	11 U	0.34 T	0.35	0.19 T	**5600**
MS-16	6/21/2012	Waste Rock Erosional Area	**0.91**	3.6	0.74 U	**12**	4 U	*33 U*	**1200**	**0.14**	10 U	0.84	0.31	0.18 T	**6400**
MS-17	6/20/2012	Mine Site north of Waste Rock Area	0.048 T	0.61	0.59 U	0.046 T	4.2 T	7.4 T	2.6 T	0.0056 U	1.3 T	0.33 T	0.01 U	0.11 U	8.1 T
MS-18	6/20/2012	Mine Site north of Waste Rock Area	0.27	1.9	0.96 U	0.61	5.3 U	11 T	**81**	0.056	4 T	0.31 T	0.042 T	0.18 U	200
MS-1-COMP	11/4/2011	30-point Composite Sample from Waste Rock at Mine Site	**1.4**	**9.2**	0.23	**19**	2	6.2	**710**	0.12 J	4.4	0.22 T	0.19	0.29 T	**4200**
MS-2-COMP	11/11/2011	30-point Composite Sample from Waste Rock at Mine Site	**1.7**	**15**	0.33	**16**	2.8	6.8	**450**	**0.25 J**	4.9	0.3 T	0.19 T	0.33 T	**4400**
MS-3-COMP	11/10/2011	30-point Composite Sample from Waste Rock at Mine Site	**6.2**	**15**	0.3	**130**	16	22	**12000**	**0.29 J**	4.4	0.4 T	1.3	0.64	**37000**
MS-4-COMP	6/26/2012	30-point Composite Sample from Waste Rock at Mine Site	**3.8**	**23**	0.56	**18**	4.1	3.4	**860**	**0.48 J**	3.4	0.3 T	0.51	0.44	**5000**
SWR-COMP	11/5/2011	30-point Composite Sample from Waste Rock to south of Mine Site	**9.4**	**30**	0.19 T	**71**	1.4	13	**5800**	**2.5 J**	4.5	0.67 T	**3.6**	**1.1**	**24000**
SWR-1-COMP	6/20/2012	30-point Composite Sample from Waste Rock to south of Mine Site	**6**	**45**	0.39	**30**	2.3	0.85 T	**1600**	**0.51**	4.5	0.41 T	0.63	0.65	**8900 J**
SWR-2-COMP	6/20/2012	30-point Composite Sample from Waste Rock to south of Mine Site	**7.7**	**32**	0.44	**34**	3	1.8	**2700**	**0.88**	4.1	0.3 T	**2**	0.67	**9600**
SWR-3-COMP	6/19/2012	30-point Composite Sample from Waste Rock to south of Mine Site	**11**	**22**	0.55	**33**	3.3	6.6	**3900**	**0.71**	3.4	0.41 T	1.8	0.81	**10000**
SWR-4-COMP	6/26/2012	30-point Composite Sample from Waste Rock to south of Mine Site	**3.2**	**18**	0.66	**22**	4.1	1.5	**700**	**0.42 J**	6.4 J	0.2 T	0.33	0.39 T	**9000**
AOI-2: Upper Tailings Pile															
UT-2-SS	10/14/2011	Upper Tailings Pile		**15**		**15 J**		**58**	**370**						**6500**
UT-3-SS	10/14/2011	Upper Tailings Pile		**11**		**12**		**150**	**690**						**4100**
UT-1	6/24/2012	UTP Erosional Area	0.099 T	1.6	0.99 U	0.34	5.5 U	10 U	11 T	0.026	2.7 T	0.5 T	0.046 T	0.18 U	79 U
UT-2	6/24/2012	UTP Erosional Area	0.064 JT	1.1 J	1 JT	0.23 J	5 JT	8.4 J	7.9 JT	0.01 JT	2.8 JT	0.52 JT	0.02 JT	0.15 UJ	79 J
UT-20	6/24/2012	Field duplicate of UT-2	0.044 T	0.76	0.73 T	0.16 T	3.5 U	6.4 U	4.9 T	0.0051 U	2 T	0.41 T	0.014 T	0.12 U	43 J
UT-3	6/24/2012	UTP Erosional Area	0.29	4.9	**1.8 T**	**2.9**	7 T	**35**	**150**	0.11	5.7 T	1	0.098 T	0.32 T	**880**
UT-4	6/24/2012	UTP Erosional Area	0.13 T	1.9	0.76 T	0.36	8.6 T	7.6 U	11 T	0.017 T	4.3 T	0.28 T	0.065 T	0.14 U	68
UT-5	6/24/2012	UTP Erosional Area	0.065 JT	1.3 J	0.8 JT	0.074 JT	4.9 JT	7.2 J	7.8 JT	0.0072 JT	2.4 JT	0.41 JT	0.044 JT	0.13 UJ	20 UJ
UT-6	6/24/2012	UTP Erosional Area	0.045 U	0.78	0.77 U	0.073 T	4.2 U	7.8 U	3.5 T	0.0063 T	1.4 U	0.45 T	0.013 U	0.14 U	22 U
UT-7	6/26/2012	UTP Erosional Area	**3.1**	**16**	0.086 U	**14**	0.66 T	13	**1200**	**0.16**	2.7	0.24 U	0.55	0.27 T	**4000**
UT-9	6/26/2012	UTP Breach Erosional Area	0.27	2	0.32	0.29	2.8	1.4	7.4	0.0097 T	1.5	0.23 U	0.029 T	0.15 U	33
UT-10	6/26/2012	UTP Breach Erosional Area	0.11 T	0.68	0.28 T	0.65	2.3	0.98 T	5.1	0.015 T	1.5	0.24 U	0.028 T	0.15 U	78
UT-11	6/26/2012	UTP Breach Erosional Area	**2.6**	**9.8**	0.089 U	**12**	0.72 T	17	**630**	**0.13**	2.3	0.25 U	0.33	0.2 T	**3600**
UT-12	6/27/2012	UTP Breach Erosional Area	**2.1**	**7.5**	0.08 U	**14**	0.67 T	13	**340**	**0.2**	1.6	0.23 U	0.32	0.16 T	**4500**
UT-13	6/27/2012	UTP Breach Erosional Area	**2.6**	**6**	0.14 T	**12**	1.4	**36**	**420**	**0.18**	2.3	0.22 U	0.31	0.17 T	**3500**
UT-14	6/27/2012	UTP Breach Erosional Area	**2.3**	**5.4**	0.37	**10**	1.9	**35**	**350**	**0.18**	2.2	0.27 U	0.26 T	0.19 T	**2800**
UT-15	6/27/2012	UTP Breach Erosional Area	**0.92**	3.4	0.17 T	**4.1**	5.8	9	**130**	0.079	1.5	0.22 U	0.1 T	0.14 U	**1200 J**
UT-16	6/27/2012	UTP Breach Erosional Area	0.25	1.1	**1.6**	0.33	2	0.78 U	10	0.013 T	1.2	0.22 U	0.039 T	0.36 T	68
UT-160	6/27/2012	Field duplicate of UT-16	0.26	1.4	**1.9**	0.33	2.5	0.79 U	8.8	0.013 T	1.5	0.22 U	0.038 T	0.41 T	85
UT-17	6/27/2012	UTP Breach Erosional Area	**1.2**	**5.3**	0.24 T	**6.5**	2.3	11	**140**	**0.18**	2.4	0.26 U	0.12 T	0.17 U	**2000**
T6-SS-100	11/6/2011	XRF Transect 6 at 100 feet	**2**	**5.7**	0.36	**1.7**	4.9	1.7	**46**	0.065	4.7	0.24 T	0.075 T	0.14 T	140
T6-SS-300	11/6/2011	XRF Transect 6 at 300 feet	0.26	1.8	0.25	0.27	3.3	1.1	6.3	0.019	3.4	0.19 U	0.03 T	0.12 U	53

Sample ID	Collection Date	General Location	Concentrations in mg/Kg												
			Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
		Surface Soil Screening Levels:	0.86	5.04	1.4	1.6	26	28	44.9	0.13	30	1.65	2	1	206
T6-SS-500	11/6/2011	XRF Transect 6 at 500 feet	0.55	3	0.38	1.6	7.1	16	10	0.052	6.3	0.47 T	0.12 T	0.19 U	42
T7-SS-100	11/7/2011	XRF Transect 7 at 100 feet	0.29	3.8	0.2 U	4	2.5	8.5	140	0.062	2.6	0.2 U	0.083 T	0.13 U	1300
T7-SS-300	11/7/2011	XRF Transect 7 at 300 feet	0.11 T	0.98	0.19 U	0.12 T	2.8	1.4	10	0.013 T	1.8	0.19 U	0.018 T	0.12 U	29
T7-SS-500	11/7/2011	XRF Transect 7 at 500 feet	0.072 T	1.3	0.38	0.57	7.1	3.5	11	0.013 T	4.2	0.42 T	0.028 T	0.12 T	140
T8-SS-100	11/5/2011	XRF Transect 8 at 100 feet	0.56	3.3	0.49	0.57	6.7	6.9	30	0.024	6.8	0.3 T	0.056 T	0.14 U	150
T8-SS-300	11/5/2011	XRF Transect 8 at 300 feet	0.66	1.4	0.27 U	0.42	4.4	3.2	20	0.059	2.5	0.27 U	0.027 T	0.17 U	46
T8-SS-500	11/5/2011	XRF Transect 8 at 500 feet	0.3	2.5	0.32	0.48	4.5	9.4	20	0.029	4.2	0.26 T	0.047 T	0.14 U	140
T9-SS-100	11/5/2011	XRF Transect 9 at 100 feet	0.092 T	1.4	0.59	0.21	5.5	7.9	6.5	0.023	5.9	0.36 T	0.037 T	0.13 U	42
T9-SS-300	11/5/2011	XRF Transect 9 at 300 feet	0.29	2.4	0.45	0.34	5	7.7	8.8	0.036	5.4	0.3 T	0.049 T	0.16 U	52
T9-SS-500	11/5/2011	XRF Transect 9 at 500 feet	0.14 T	2.8	0.47	0.24	5.7	6.2	8.4	0.03	6.5	0.39 T	0.03 T	0.15 U	65
T10-SS-150	11/6/2011	XRF Transect 10 at 150 feet	1.7	3.6	0.33	0.67	5	7	62	0.082	5.6	0.36 T	0.051 T	0.18 T	88
T10-SS-500	11/6/2011	XRF Transect 10 at 500 feet	0.54	5.4	0.33	1.8	4.5	15	32	0.016 T	4.9	0.32 T	0.12 T	0.14 T	510
T10-SS-750	11/6/2011	XRF Transect 10 at 750 feet	0.12 T	1.7	0.46	0.21	4.9	4.5	6	0.028	7.5	0.25 T	0.026 T	0.13 U	73
AOI-3: Lower Tailings Pile															
LT-DP-1	11/8/2011	LTP Detention Pond	2.8	13	0.1 T	17	3.6	56	600	0.21 J	3.8	0.27 U	0.23 T	0.27 T	5700
LT-OC ROAD-CULVERT	11/9/2011	Lower Tailings Pile Onion Creek Road Culvert	0.8	4.5	0.21 T	3.9	4	14	59	0.051 J	7.1	0.45 T	0.14 T	0.14 T	530
LT-1-SS	10/14/2011	Lower Tailings Pile		6.2		35		23	9500						11000
LT-2-SS	10/14/2011	Lower Tailings Pile		3.1		19		77	2700						5200
LT-1	6/23/2012	LTP Erosional Area	0.26	1.5	0.81 UJ	0.34	8.5 T	8.2 UJ	8.1 T	0.018 T	11 U	0.31 T	0.056 T	0.15 U	49
LT-2	6/23/2012	LTP Erosional Area	0.34	2.2	0.81 U	0.62	8.3 T	8.2 U	16 T	0.021	11 U	0.46 T	0.11 T	0.15 U	75
LT-3	6/23/2012	LTP Erosional Area	1	2.3	0.89 U	0.88	4.9 U	9 U	29	0.03	13 U	0.35 T	0.052 T	0.16 U	69
LT-4	6/23/2012	LTP Erosional Area	0.4	2.4	0.85 U	0.63	4.7 U	10 T	15 T	0.033	12 U	0.36 T	0.08 T	0.16 U	60
LT-5	6/23/2012	LTP Erosional Area	0.58	1.9	0.88 U	0.43	6 T	8.9 U	24	0.039	1.6 U	0.25 U	0.031 T	0.16 U	41
LT-6	6/23/2012	LTP Erosional Area	0.51 J	4.8 J	1.7 JT	0.96 J	7.3 JT	17 JT	44 J	0.045 J	6.6 JT	1.2 J	0.089 JT	0.23 UJ	150 J
LT-7	6/23/2012	LTP Erosional Area	0.69	4.9	0.93 U	4.5	5.1 U	10 T	190	0.053	3 T	0.32 T	0.059 T	0.17 U	1200
LT-8	6/23/2012	LTP Erosional Area	0.19 T	1.1	0.82 T	0.19 T	4.7 T	12	5.9 T	0.013 T	2.9 T	0.41 T	0.038 T	0.14 U	23 U
LT-9	6/23/2012	LTP Erosional Area	0.25	2.2 J	0.96 T	0.41	4.9 U	11 T	17 T	0.02 T	3.8 T	0.5 T	0.03 T	0.16 U	52 U
LT-90	6/23/2012	Field duplicate of LT-9	0.27	7 J	1.2 T	0.64	4.9 U	14	8.3 T	0.017 T	7.9 T	0.62 T	0.032 T	0.19 T	34 U
LT-10	6/23/2012	LTP Erosional Area	0.51	4.1	0.97 U	1.3	5.3 U	13 T	65	0.036	6.3 T	0.43 T	0.059 T	0.18 U	220
LT-11	6/23/2012	LTP Erosional Area	2.4	9.5	1 U	5.9	5.8 U	130	250	0.072	4.6 T	0.49 T	0.11 T	0.19 U	2200
LT-12	6/26/2012	LTP Erosional Area	2.2	14	0.11 U	6.8	1.1 T	10	490	0.11	2	0.31 U	0.21 T	0.2 U	1900
LT-13	6/26/2012	LTP Erosional Area	0.094 T	1.2	0.075 T	0.2	1.2	1.4	2.9	0.0058 T	1.4	0.25 T	0.27	0.12 U	14
LT-14	6/26/2012	LTP Erosional Area	0.81	3.1	0.25 T	0.96	3.8	7.7	37	0.036	3.3	0.45 T	0.06 T	0.19 U	150
LT-15	6/26/2012	LTP Erosional Area	0.81	1.3	0.25 T	0.28	3.5	11	14	0.0065 T	3.2	0.27 T	0.04 T	0.16 U	60
LT-16	6/21/2012	LTP discrete sample	0.77	4.2	0.91 U	1.1	5 U	26 U	19	0.029	13 U	0.5 T	0.13 T	0.17 U	91
LT-17	6/21/2012	LTP discrete sample	0.54	3.4	0.81 U	0.86	4.5 U	13 U	13 T	0.021	11 U	0.46 T	0.13 T	0.15 U	68
LT-18	6/21/2012	LTP discrete sample	0.55	3.6	0.85 U	1.1	4.7 U	19 U	11 T	0.026	12 U	0.43 T	0.14 T	0.16 U	77
LT-180	6/21/2012	Field duplicate of LT-18	0.58	3.6	0.87 U	0.85	4.8 U	22 U	10 T	0.026	12 U	0.43 T	0.15 T	0.16 U	69
LT-19	6/21/2012	LTP discrete sample	0.4	3.1	0.91 U	0.46	5 U	13 U	6.1 T	0.025	24	0.37 T	0.077 T	0.17 U	63
LT-190	6/21/2012	Field duplicate of LT-19	0.41	3.3	0.85 T	0.55	4.6 T	14 U	6 T	0.019 T	12 U	0.43 T	0.085 T	0.15 U	54
LT-20	6/22/2012	LTP discrete sample	0.23	2.4	0.77 U	0.86	4.2 U	13	16	0.019	4.5 T	0.37 T	0.059 T	0.14 U	99
LT-21	6/22/2012	LTP discrete sample	0.32	2.1	0.95 T	0.48	4.9 U	9 U	10 T	0.016 T	5.5 T	0.41 T	0.099 T	0.16 U	40 U
LT-22	6/22/2012	LTP discrete sample	1	7.6	0.95 U	5.3	5.2 U	110	380	0.091	3.9 T	0.37 T	0.2 T	0.17 U	1400
LT-23	6/22/2012	LTP discrete sample	0.16 T	1.7	0.78 U	0.37	4.3 U	12	6.7 T	0.015 T	3.8 T	0.33 T	0.057 T	0.14 U	29 U
T1-SS-100	11/4/2011	XRF Transect 1 at 100 feet	1.2	5.2	0.29	3.7	5.6	31	170	0.071	6	0.29 T	0.12 T	0.15 T	1200
T1-SS-300	11/4/2011	XRF Transect 1 at 300 feet	0.43	3.3	0.43	0.41	6.3	11	7.9	0.023	9.3	0.37 T	0.12 T	0.14 U	75
T1-SS-500	11/4/2011	XRF Transect 1 at 500 feet	0.54	2.4	0.3	0.77	5.5	8.1	43	0.025	7.8	0.32 T	0.078 T	0.14 U	170
T2-SS-100	11/4/2011	XRF Transect 2 at 100 feet	0.67	3.4	0.31	0.65	8.3	16	21	0.019	12	0.52 T	0.14 T	0.19 T	140
T2-SS-300	11/4/2011	XRF Transect 2 at 300 feet	0.58	10	0.21 U	9.7	4.6	18	420	0.08	4	0.21 U	0.086 T	0.21 T	2900
T2-SS-500	11/4/2011	XRF Transect 2 at 500 feet	0.78	4.9	0.46	1.3	7.6	11	12	0.038	12	0.53 T	0.27	0.15 T	110
T3-SS-100	11/3/2011	XRF Transect 3 at 100 feet	0.74	3.3	0.52	1.1 J	9.3	4.8	24	0.038	12	0.35 T	0.18 T	0.23 T	190
T3-SS-300	11/3/2011	XRF Transect 3 at 300 feet	5	8.7	0.28	8.7	2.9	180	880	0.1	4.3	0.23 U	0.26	0.42 T	1900
T3-SS-320	11/3/2011	Field duplicate of T3-SS-300	4.5	8.3	0.2 T	8.1	2.9	180	840	0.096	4.4	0.2 U	0.25	0.35 T	1700

Sample ID	Collection Date	General Location	Concentrations in mg/Kg											
			Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
		Surface Soil Screening Levels:	**0.86**	**5.04**	**1.4**	**1.6**	**26**	**28**	**44.9**	**0.13**	**30**	**1.65**	**2**	**1**	**206**
T3-SS-500	11/3/2011	XRF Transect 3 at 500 feet	**1.3**	4.3	0.45	1.3	9.1	9.4	24	0.027	12	0.44 T	0.18 T	0.22 T	130
T4-SS-100	11/3/2011	XRF Transect 4 at 100 feet	**2.4**	**9**	0.2 U	**11**	4.8 JT	25	**300**	0.1	3.2	0.2 U	0.15 T	0.23 T	**4100 J**
T4-SS-120	11/3/2011	Field duplicate of T4-SS-100	**2.9**	**9.8**	0.057 U	**12**	0.64 JT	26	**310**	0.086	2.9	0.16 U	0.16	0.18 T	**1900 J**
T4-SS-300	11/3/2011	XRF Transect 4 at 300 feet	0.64	3.9	0.29	0.68	4.8	6.9	**21**	0.055	5.8	0.35 T	0.067 T	0.13 U	85
T4-SS-500	11/3/2011	XRF Transect 4 at 500 feet	0.25	3	0.44	0.85	7.5	11	16	0.026	8.6	0.41 T	0.11 T	0.14 T	160
T5-SS-100	11/4/2011	XRF Transect 5 at 100 feet	0.18 T	2.2	0.2 U	0.24	2.7	3.7	4.3	0.018	3.3	0.22 T	0.065 T	0.13 U	45
T5-SS-300	11/4/2011	XRF Transect 5 at 300 feet	0.35	1.5	0.26 U	0.45	3.8	5	17	0.016	3.7	0.35 T	0.036 T	0.13 U	88
T5-SS-500	11/4/2011	XRF Transect 5 at 500 feet	0.6	2.3	0.38	0.58	6.1	8.3	13	0.031	8.6	0.41 T	0.11 T	0.15 U	73
AOI-4:Tailings Pipeline and Access Road															
DR-1	6/25/2012	Public Access Road	**2.2**	**10**	0.28	**3.1**	10	**28**	10	0.043	26	0.89	0.52	0.18 T	150
DR-2	6/25/2012	Public Access Road	**1.6**	**9.5**	0.21 T	**1.8**	8.7	23	9.9	0.036	23	1	0.38	0.15 T	120
DR-3	6/25/2012	Public Access Road	**2.1**	**9.8**	0.29	**2.6**	9.7	24	8.8	0.032	25	0.99	0.44	0.16 T	140
DR-4	6/25/2012	Van Stone Access Road	0.26	1.5	0.2 T	0.73	3.7	4.8	6	0.0052 U	3	0.18 U	0.046 T	0.12 U	120
DR-5	6/25/2012	Public Access Road	**1.9**	**8.2**	0.28	**1.9**	9	21	7.7	0.027	24	1.1	0.36	0.14 T	120
DR-6	6/25/2012	Van Stone Access Road	0.27	2.2	0.19 T	0.45	4.5	8.4	36 J	0.0054 U	3.2	0.36 T	0.038 T	0.13 U	56 J
DR-7	6/25/2012	Van Stone Access Road	0.22	1.2	0.2 T	0.27	4.2	6.7	12	0.0053 T	2.7	0.32 T	0.044 T	0.12 U	**41**
DR-8	6/25/2012	Van Stone Access Road	0.23	1	0.16 T	0.29	4.1	7.1	7	0.0051 T	2.5	0.31 T	0.047 T	0.13 U	40
DR-9	6/25/2012	Van Stone Access Road	0.22	1.2	0.22 T	0.31	3.9	5.8	13	0.0073 T	2.5	0.35 T	0.041 T	0.13 U	52
DR-10	6/25/2012	Van Stone Access Road	0.21	1.2	0.18 T	0.31	2.8	5.5	7.3	0.0068 T	2.6	0.32 T	0.04 T	0.12 U	40
DR-11	6/25/2012	Van Stone Access Road	0.24	0.91	0.19 T	0.26	2.7	4	10	0.0054 U	1.5	0.24 T	0.023 T	0.14 U	49
DR-12	6/25/2012	Van Stone Access Road	0.12 T	0.73	0.17 T	0.21	2.4	3.8	12	0.0053 U	1.1	0.22 T	0.015 T	0.13 U	36
DR-13	6/25/2012	Van Stone Access Road	0.094 T	0.68	0.24	0.24	3.2	4.4	11	0.0052 U	1.3	0.26 T	0.013 T	0.12 U	57
DR-14	6/25/2012	Van Stone Access Road	0.06 T	0.6	0.18 T	0.13 T	3	4.1	5.5	0.0055 U	0.95 T	0.29 T	0.012 U	0.13 U	17
DR-15	6/25/2012	Van Stone Access Road	**1**	1	0.13 T	0.87	2.9	3.5	**64**	0.01 T	1.7	0.23 T	0.034 T	0.13 U	170
TAILINGS BOX	11/8/2011	Tailings Box Pile, located along the pipeline	**5**	**12**	0.084 T	**25**	3.7	**81**	**760**	**0.45** J	4.5	0.27 T	0.31	0.21 T	**7700**
UT-LT-2000'	11/10/2011	Upper and Lower Tailings Pile Pipeline 2000ft	**2.1**	**14**	0.11 T	**10**	3.3	**34**	**470**	0.11 J	3.9	0.23 T	0.18 T	0.3 T	**3200**
UT-LT-4000'	11/10/2011	Upper and Lower Tailings Pile Pipeline 4000ft	**1.3**	**7.4**	0.14 T	**5.5**	1.9	14	**220**	0.041 J	2.6	0.25 T	0.11 T	0.14 T	**1400**
PL-1	6/25/2012	Tailings Pipeline	**4.2**	**21**	0.14 T	**11**	2.3	**75 J**	**860**	**0.16**	2.8	0.24 U	0.21 T	0.22 T	**3000**
PL-2	6/25/2012	Tailings Pipeline	**0.9**	**6.4**	0.078 U	**3.8**	0.91 T	12	**250**	0.036	1.5	0.24 T	0.12 T	0.23 T	**870**
PL-3	6/25/2012	Tailings Pipeline	0.16 T	0.93	0.36	0.25	2.2	0.9 T	6.9	0.0099 T	1.4	0.24 T	0.035 T	0.13 U	36
PL-4	6/25/2012	Tailings Pipeline	0.22	2.4	0.42	0.3	5.2	4.6	21	0.018	3.5	0.28 T	0.054 T	0.12 U	65
PL-5	6/25/2012	Tailings Pipeline	**1.2**	3.5	0.13 T	**5.5**	1.7	23	**280**	0.069	2.2	0.25 T	0.086 T	0.2 T	**1700**
PL-6	6/26/2012	Tailings Pipeline	0.35 J	**6.2 J**	0.079 UJ	**5.4 J**	1.6 J	16 J	**320 J**	0.068 J	2.4 J	0.23 UJ	0.12 JT	0.23 JT	**1300 J**
PL-7	6/26/2012	Tailings Pipeline	0.2 T	0.5 T	0.18 T	0.13 T	1.1 T	1.3	7.6	0.0042 T	0.77 T	0.22 T	0.012 T	0.13 U	28
PL-8	6/25/2012	Tailings Pipeline	**1.1**	**18**	0.069 U	**21**	2.3	**70**	1000	**0.29**	4.7	0.32 T	0.4	0.29 T	**6300**
PL-9	6/25/2012	Tailings Pipeline	0.11 T	1.1	0.45	0.21 T	3.6	3.1	7.1	0.01 T	2.2	0.44 T	0.02 T	0.16 U	25
PL-10	6/26/2012	Tailings Pipeline	0.17 JT	2.1 J	0.72 J	0.28 J	5 J	5.5 J	10 J	0.017 JT	4.2 J	0.35 JT	0.051 JT	0.16 UJ	45 J
PL-11	6/26/2012	Tailings Pipeline	0.62	**8.3**	0.079 U	**7.6**	2.3	10	**380**	0.065	2.3	0.27 T	0.086 T	0.17 T	**1900**
PL-12	6/27/2012	Tailings Pipeline	0.13 T	1.4	0.31	0.7	3.2	3.4	22	0.014 T	3	0.42 T	0.049 T	0.14 U	140
PL-13	6/27/2012	Tailings Pipeline	**1.3**	**13**	0.18 T	4.4	1.7	25	**560**	0.043	1.6	0.3 T	0.1 T	0.16 T	**1100**
PL-14	6/27/2012	Tailings Pipeline	0.23 JT	2.8 J	0.54 J	0.64 J	4.5 J	6.3 J	27 J	0.023 J	4.8 J	0.45 JT	0.1 JT	0.17 UJ	99 J
PL-15	6/27/2012	Tailings Pipeline	**1.1 J**	**10 J**	0.087 UJ	**24 J**	5 J	**45 J**	**570 J**	**0.23** J	2.5 J	0.28 JT	0.2 JT	0.22 JT	**5200 J**
AOI-5: Onion Creek and Tributaries															
BG-12-SS	10/7/2011	Onion Creek Sample	0.19 T	3.3	0.46	1.5	7.8	3.6	**46**	0.045	5.9	0.66 T	0.066 T	0.17 T	**460**

Notes:
U = Not detected at reporting limit indicated
J = Estimated value
T = Value is between the MDL and MRL
Bold = Concentration exceeds criteria