HRS DOCUMENTATION RECORD (HRS)—REVIEW COVER SHEET

Name of Site: ANACONDA COPPER MINE

Contact Person: Sharon Murray, EPA Region 9 (415) 972-4250

Site Investigation: Eugenia Chow, EPA Region 9 (415) 972-3160

Documentation Record: Christina Marquis, Weston Solutions, Inc. (818) 350-7308

Pathways, Components, or Threats Not Scored

Surface Water Pathway

Storm water runoff from the Anaconda facility enters the Wabuska Drain, a return-flow irrigation ditch located to the northeast of the facility. The Wabuska Drain originates immediately to the east of the facility, flows westward for about 0.25 mile, parallels a tailings pond levee road, then proceeds northward through the Mason Valley. The Wabuska Drain discharges into the Walker River at the north end of the valley, approximately 10 miles from the facility (Ref. 3; Ref. 4, p. 26). Hazardous substances from the facility have been reported in both the Wabuska Drain and an irrigation ditch north of the facility (Ref. 4, pp. 17, 26, 151). However, there are no drinking water intakes, fisheries, or sensitive environments associated with the irrigation ditch north of the facility or with the Wabuska Drain within the site Target Distance Limit (Ref. 4, p. 26).

The Walker River is located approximately 1,400 feet east of the southern portion of the facility, then flows northeast away from the facility. The Walker River flows between the facility and the town of Yerington. According to the United States Fish and Wildlife Service, the Walker River provides habitat for the Lahontan cutthroat trout (Ref. 11, p. 1).

Past activities at the facility have also created aquatic areas that could attract wildlife. These areas include the drain-down ponds that seasonally retain water and drain-down solution. They may provide drinking water for wildlife at the facility or landing areas for migratory birds (Ref. 9, p. 1).

Although releases of hazardous substance in the surface water pathway concern EPA for the reasons stated above, it is not necessary to score the pathway as part of this HRS site evaluation at this time because it would not likely contribute significantly to the overall site score.

Soil Exposure Pathway

The soil exposure pathway was not scored because there are currently no known resident individuals, workers, sensitive environments, or resources on or within 200 feet of sources at the site (Ref. 41, p. 43). Resident Individuals are evaluated only if they are within 200 feet of the area of observed contamination and sensitive environments are only evaluated if they are "located on an area of observed contamination" (Ref. 1, Section 5.1).

Air Migration Pathway

The air pathway was not scored because there is no documented observed release to the atmosphere (Ref. 41, pp. 14-15). Sources 9 and 10, which were previously documented to create dust hazards, have been capped, and there is no observed release in the air migration pathway

(Ref. 24, p. 8; Ref. 29, pp. 11, 53; Ref. 39, p. 28). Scoring the potential to release to air would not likely contribute significantly to the overall site score.

Radionuclides

When the ore was processed for copper by Arimetco, it produced Technologically Enhanced Naturally Occurring Radioactive Material (TENORM), in which radioactive minerals were either concentrated above natural levels or moved from their natural location, causing an increased risk for exposure and offsite migration. TENORM has been identified within the former Anaconda Mine property including materials with elevated levels of radium-226, radium-228, thorium-230, thorium-232, and uranium-238 (Ref. 26, pp. 2, 399; Ref. 29, p. 58).

Although uranium is documented in sources within the former Anaconda Mine property, and is of concern to EPA, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances (Ref. 4, pp. 79-80; Ref. 35, pp. 163, 166, 168-169, 171-172; Ref. 39, pp. 64-69).

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HRS DOCUMENTATION RECORD

Name of Site:	ANACONDA COPPER MINE
EPA ID#:	NVD083917252
EPA Region:	9
Date Prepared:	September 2016
Street Address of Site:	Yerington Mine, 102 Burch Drive
City, County and State:	Yerington, Lyon County, Nevada, 89447
Topographic Map:	Yerington, NV and Mason Valley, NV USGS 7.5-Minute Quadrangles

Latitude: 38^{o} 59’ 24.98” North Longitude: 119º 11’ 13.44” West (Ref. 3; Ref. 4, p. 51)

Latitude/Longitude Reference Point: The latitude and longitude correspond to sample location T-1 collected from Source 5 during the 2000 Superfund Technical Assessment and Response Team (START) sampling event (Ref. 4, pp. 2, 51).

SCORES		
Air Pathway	=	Not scored
Ground Water Pathway	=	100
Soil Exposure Pathway	=	Not scored
Surface Water Pathway	=	Not scored
HRS SITE SCORE	**=**	**50**

*The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area where the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, placed, or has otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

HAZARD RANKING SYSTEM SUMMARY SCORESHEETS

SITE NAME: ANACONDA COPPER MINE

CITY/COUNTY/STATE: Yerington, Lyon County, Nevada

EPA ID #: NVD083917252

EVALUATOR: Christina Marquis DATE: September 2016

LATITUDE: 38° 59’ 24.98” N **LONGITUDE:** 119° 11’ 13.44” W

	S	S^2
Ground Water Migration Pathway Score (S_{gw})	100	10,000
Surface Water Migration Pathway Score (S_{sw})	Not scored	Not scored
Soil Exposure Pathway Score (S_s)	Not scored	Not scored
Air Migration Pathway Score (S_a)	Not scored	Not scored
$S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$	XXXXXXX	10,000
$(S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2) / 4$	XXXXXXX	2,500
SQRT $((S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2) / 4)$	XXXXXXX	50

TABLE 3-1
GROUND WATER MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors		
Likelihood of Release to an Aquifer	Maximum Value	Value Assigned
1. Observed Release	550	550
2. Potential to Release		
2a. Containment	10	_
2b. Net Precipitation	10	_
2c. Depth to Aquifer	5	_
2d. Travel Time	35	_
2e. Potential to Release [lines 2a x (2b + 2c + 2d)]	500	_
3. Likelihood of Release (higher of lines 1 and 2e)	550	550
Waste Characteristics		
4. Toxicity/Mobility	a	10,000
5. Hazardous Waste Quantity	a	10,000
6. Waste Characteristics	100	100
Targets		
7. Nearest Well	50	20
8. Population		
8a. Level I Concentrations	b	NS
8b. Level II Concentrations	b	NS
8c. Potential Contamination	b	223.3
8d. Population (lines 8a + 8b + 8c)	b	223.3
9. Resources	5	5
10. Wellhead Protection Area	20	NS
11. Targets (lines 7 + 8d + 9 + 10)	b	248.3
GROUND WATER MIGRATION SCORE FOR AN AQUIFER		
12. Aquifer Score [(lines 3 x 6 x 11)/82,500][c]	100	100
GROUND WATER MIGRATION PATHWAY SCORE		
13. Pathway Score (S_{gw}), (highest value from line 12 for all aquifers evaluated)[c]	100	100

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] Do not round to nearest integer.

REFERENCES

Reference Number	Description of the Reference
1	40 CFR Part 300, Hazard Ranking System; Final Rule, 14 December 1990, Vol. 55, No. 241, http://semspub.epa.gov/work/11/174028.pdf, 138 pages.
2	U.S. Environmental Protection Agency (EPA), Superfund Chemical Data Matrix (SCDM) Methodology, Accessed June 24, 2016, 9 pages. Available online: http://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm
3	U.S. Geological Survey, 7.5 Minute Topographic Maps of Yerington, Nevada and Mason Valley, Nevada. Provisional Edition 1987 and 1986, 2 sheets.
4	Ecology & Environment, Inc., Expanded Site Inspection, Anaconda Copper Company, Yerington Mine, December 14, 2000, 344 pages.
5	Hatch, Ginny and Dunn, Deborah, Yerington Paiute Indian Reservation, Environmental Protection Agency, conversation recorded on contact report by Brian Reilly, April 14, 2015, 1 page. *To protect the security of well locations, this reference is not included. The full reference may be made available upon request.*
6	Sawyer, Joe, SRK Consulting, telephone conversation recorded on contact report by Benjamin Castellana, START, December 7, 2000, 1 page.
7	Brown and Caldwell, 2014 Annual Operations and Maintenance Report, Arimetco Heap Leach Fluid Management System, Yerington Mine Site, March 31, 2015, 4,604 pages.
8	Flakus, Jay, City of Yerington Public Works, conversation recorded on contact report by Brian Reilly, April 13, 2015, 1 page. *To protect the security of well locations, this reference is not included. The full reference may be made available upon request.*
9	U. S. Department of the Interior, Fish and Wildlife Service, letter to Roy Thun, Environmental Business Manager, Atlantic Richfield Company, re: Approval for the "Mitigation Plan for Deterring Birds from Lined Evaporation and Pumpback Ponds - Yerington Mine Site", September 3, 2008, 3 pages.
10	Tibbals, Joy M., conversation recorded on contact report by Brian Reilly and Christina Marquis, August 19, 2016, 2 pages. *To protect the security of well locations, this reference is not included. The full reference may be made available upon request.*
11	U. S. Department of the Interior, Fish and Wildlife Service, letter to Nadia Hollan-Burke, Remedial Project Manager, U.S. Environmental Protection Agency - Region 9, re: Species List for the Anaconda Yerington Mine, Lyon County, Nevada, March 9, 2010, 3 pages.
12	Atlantic Richfield Company, Submittal of the VLT XRF Characterization Data Summary Report, Yerington Mine Site; Administrative Order on Consent and Settlement Agreement for Removal Action and Past Response Costs, EPA Region 9 Docket No. 09-2009-0010, July 23, 2010, 607 pages.
13	Shipes, Roy H., President Western States Engineering, letter to Bonnie Arthur, U.S. Environmental Protection Agency, October 16, 2001, 8 pages.

14	Superfund Technical Assessment and Response Team, Anaconda, Yerington Mine Site Emergency Response Assessment Final Report, November 1, 2001, 168 pages.
15	Brown & Caldwell, Draft Supplemental Characterization Work Plan, Anaconda Evaporation Ponds, Yerington Mine Site, January 31, 2014, 1,016 pages.
16	S.S. Papadopulos & Associates, Inc., Groundwater Flow Model, Yerington Mine Site, Nevada, March 18, 2014, 313 pages.
17	Ling, S. Yann, Site Inspection Prioritization, Anaconda Copper Co. Yerington Mine, September 8, 1994, 77 pages.
18	Reference number reserved.
19	Dalton, Dennis, Arimetco Yerington Mine and Process Facility Site Assessment of Groundwater Quality, July 1998, 224 pages.
20	Arimetco, Inc., Water Pollution Control Report Third Quarter 1999 for Permit NEV88039, October 28, 1999, 48 pages.
21	Applied Hydrology Associates, Evaluation of Water Quality and Solids Leaching Data Adjacent to the Weed Heights Operation Near Yerington, Nevada, May 25, 1983, 97 pages.
22	Brown and Caldwell, Data Summary Report for Process Areas Soil Characterization, November 1, 2005, 712 pages.
23	Brown and Caldwell, Site-Wide Groundwater Operable Unit (OU-1) Remedial Investigation Work Plan, Revision 1, Yerington Mine Site, February 7, 2014, 329 pages.
24	Brown and Caldwell, Draft Implementation Work Plan, Anaconda Evaporation Pond Removal Action, Yerington Mine Site, November 4, 2009, 200 pages.
25	Proffett, J.M., and J.H. Dilles. Geologic Map of the Yerington District, Nevada. Nevada Bureau of Mines and Geology, 1984, 1 sheet.
26	Team 9, Anaconda Mine Radiation Assessment, Letter Report, August 15, 2008, 463 pages.
27	U.S. Census Bureau, State & County QuickFacts, Lyon County, Nevada, http://www.census.gov/quickfacts/table/PST045214/32019,00, accessed May 20, 2016, 3 pages.
28	Sawyer, Joe, SRK Consulting, Email communication to Art Gravenstein, November 17, 2003, 4 pages.
29	CH2M Hill Inc., Draft Historical Summary Report, Anaconda-Yerington Mine Site, Yerington, Nevada, February 2010, 92 pages.
30	Brown & Caldwell, Domestic Well List, 4th Quarter 2015, September 22, 2015, 7 pages. *To protect the privacy of individual residents, this reference is not included. The full reference may be made available upon request.*
31	Huxel, C.J., Jr., Water Resources and Development in Mason Valley, Lyon and Mineral Counties, Nevada, 1948 - 65, State of Nevada Department of Conservation and Natural Resources Division of Water Resources, Water Resources Bulletin No. 38, 1969, 63 pages.

32	Seitz, H.R., Van Danburgh, A.S., and La Camera, R.J., Ground-Water Quality Downgradient from Copper-Ore Milling Wastes at Weed Heights, Lyon County, Nevada, U.S. Geological Survey Open-File Report 80-1217, 1982, 51 pages.
33	Brown & Caldwell, First Quarter 2015 Groundwater Monitoring Report, Yerington Mine Site, September 2, 2015, 44,404 pages.
34	Reference number reserved.
35	CH2M Hill, Inc., Final Remedial Investigation Report, Arimetco Facilities Operable Unit 8, Anaconda Yerington Copper Mine, September 2011, 360 pages.
36	Brown and Caldwell, Draft Final Arimetco Heap Leach and Process Components Work Plan, March 12, 2003, 63 pages.
37	Brown and Caldwell, Draft Cover Materials Characterization Work Plan, Yerington Mine Site, June 25, 2010, 676 pages.
38	CH2M Hill Inc., Anaconda-Yerington Mine Site Data Quality Report for the 3rd Quarter Field Sampling Event, January 20, 2010, 130 pages.
39	Brown and Caldwell, Anaconda Evaporation Ponds Removal Action Characterization Data Summary Report Revision I, Yerington Mine Site, October 15, 2009, 4,027 pages.
40	Brown & Caldwell, First Quarter 2015 Domestic Well Monitoring Report, Yerington Mine Site, July 24, 2015, 13,287pages.
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42	CH2M Hill Inc., Hydrogeologic Assessment for the Anaconda-Yerington Copper Mine, March 2, 2009, 26 pages.
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44	CH2M Hill Inc., Final Supplemental Remedial Investigation Report, Arimetco Facilities Operable Unit 8, Anaconda Yerington Copper Mine, October, 2011, 625 pages.
45	U.S. Environmental Protection Agency, Solid Waste and Emergency Response, Using Qualified Data to Document an Observed Release and Observed Contamination, November 1996, 18 pages.
46	SRK Consulting, Phase 1 Environmental Site Assessment Update, Anaconda/Yerington Mine Site, January 11, 2010, 128 pages.
47	Chambers Group, Inc. and Golder Associates, Inc., Phase I Environmental Site Assessment, Anaconda/Yerington Mine Site, Yerington, Lyon County, Nevada, April 17, 2008, 382 pages.
48	King, R.U., and Roberts, W.A., Radioactive Deposits of Nevada: A contribution to the Geology of Uranium, United States Geological Survey Bulletin 1009-C, 1954, 48 pages.
49	CH2MHill, Inc., Draft Data Evaluation Report, Arimetco Heap Leach Pads, Remedial Investigation, Anaconda Copper Yerington Mine Site, March 2008, 105 pages.
50	SVL Analytical, Inc., USEPA-CLP Data Package, Case No: 36759, SDG No: MY3JT7, November 11, 2007, 148 pages.
51	Yerington Paiute Tribe, Campbell Ranch Uranium/Arsenic Removal Water Treatment Plant, As-Built, November 6, 2012, 59 pages.

52	ICF International, Review of Analytical Data, Tier 3, Case No.: 36759, SDG No.: MY3JT0, April 18, 2008, 33 pages.
53	Data Chem Laboratories, Inc., Laboratory Data Package, Case: 7306022, SDG: MY3JS8, November 21, 2007, 296 pages.
54	SVL Analytical, Inc., USEPA-CLP Data Package, Case No: 36759, SDG No: MY3JT0, November 4, 2007, 211 pages.
55	ICF International, Review of Analytical Data, Tier 3, Case No.: 36759, SDG No.: MY3JQ8, April 16, 2008, 30 pages.
56	Data Chem Laboratories, Inc., Laboratory Data Package, Case: 36759, SDG: MY3JQ8, November 21, 2007, 246 pages.
57	SVL Analytical, Inc., USEPA-CLP Data Package, Case No: 36759, SDG No: MY3JT3, October 29, 2007, 145 pages.

ACRONYM LIST

amsl	above mean sea level
ARC	Atlantic Richfield Company
bgs	below ground surface
BLM	Bureau of Land Management
CLP	Contract Laboratory Program
DWMP	Drinking Water Monitoring Program
EPA	United States Environmental Protection Agency
FEP	Finger Evaporation Pond
FSP	Field Sampling Plan
gpm	gallons per minute
HDPE	High-Density Polyethylene
HLP	Heap Leach Pad
HRS	Hazard Ranking System
LEP	Lined Evaporation Pond
MCL	Maximum Contaminant Level
mg/l	milligrams per liter
mg/kg	milligrams per kilogram
NDEP	Nevada Division of Environmental Protection
pCi/g	picocuries per gram
PLS	Pregnant Leach Solution
QAPP	Quality Assurance Project Plan
RI	Remedial Investigation
RI/FS	Remedial Investigation and Field Study
SAP	Sampling and Analysis Plan
START	Superfund Technical Assessment and Response Team
SX/EW	Solution Extraction/Electrowinning
TENORM	Technologically Enhanced Naturally Occurring Radioactive Material
UEP	Unlined Evaporation Pond
USGS	U.S. Geological Survey
VLT	Vat Leachate Tailings

NOTES TO THE READER

Page numbers have been added to the references in the lower right corner. For reference citations, please refer to the page numbers in this location.

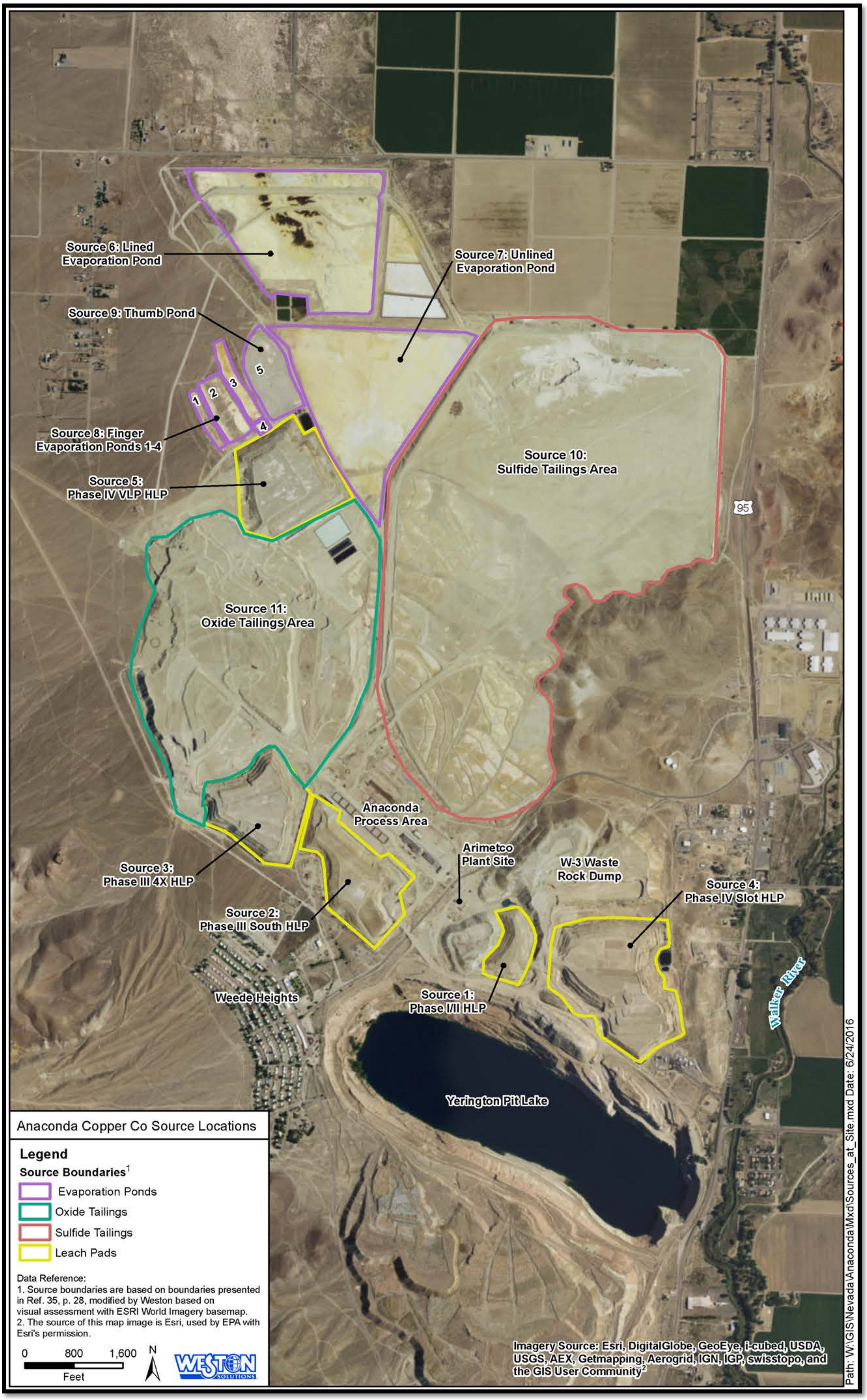

Figure 1: Anaconda Copper Mine Facility Layout and Site Sources

SITE DESCRIPTION

The Anaconda Mine site consists of the release of hazardous substances from mining and mining related operations conducted on the former Anaconda Mine property. Eleven hazardous substance sources are scored as part of the site. Sources 1 through 5 are the five Arimetco HLPs. Sources 6 through 9 consist of evaporation ponds located in the northwest portion of the site that were used by Anaconda for evaporation of process solutions (Ref. 24, pp. 6-7; Ref. 39, pp. 23, 25-28, 50-51). Source 10 is the Sulfide Tailings Area in the northeast portion of the site, used by Anaconda for disposal of slurried sulfide tailings (Ref. 24, p. 8; Ref. 29, p. 52). Source 11 is the Oxide Tailings Area in the eastern portion of the site, used by Anaconda for disposal of oxide tailings from Anaconda's vat leach process (Ref. 24, p. 9; Ref. 29, pp. 55-56). Hazardous substances associated with these sources include arsenic, cadmium, chromium, copper, lead, manganese, nickel, and/or zinc (see Section 2.2). Although uranium is documented in many of these sources (Ref. 4, pp. 79-80; Ref. 35, pp. 163, 166, 168-169, 171-172; Ref. 39, pp. 64-69), radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances. An observed release of these hazardous substances is documented from the site sources to ground water of the Mason Valley Alluvial Aquifer (see Section 3.1.1) (Ref. 33, pp. 902-904). Targets potentially affected by releases from these sources include public and private drinking water wells screened in the Mason Valley Alluvial Aquifer located within 4 miles of the site sources (see Section 3.3.2.4) (Ref. 3; Ref. 7 ; Ref. 8; Ref. 10; Ref. 30; Ref. 40, pp. 10-12, 16-23, 54).

The former Anaconda Mine property covers approximately 3,400 acres, located approximately one mile west of the City of Yerington, Lyon County, Nevada (Ref. 17, p. 5; Ref. 47, p. 14). The facility is an inactive copper mine with an open pit (known as the Yerington Pit), waste rock piles, tailings piles, evaporation ponds, and process areas (Ref. 47, p. 14). The facility layout is presented in Figure 1.

Copper was discovered in the Yerington District in the 1860s (Ref. 29, p. 7; Ref. 35, p. 16; Ref. 47, p. 36). Large-scale exploration of the porphyry copper system occurred in the early 1900s when the area was organized into a mining district by Empire-Nevada Copper Mining and Smelting Company (Ref, 29, p. 7; Ref. 35, pp. 16-17). Operations began at the former Anaconda Mine property around 1918 as the Empire Nevada Mine (Ref. 13, p. 1; Ref. 19, p. 7; Ref. 29, p. 8; Ref. 47, p. 36). Anaconda Copper Mining Company leased the facility in 1941, purchased it in 1951, and then conducted active mining operations from 1953 through 1977, when Atlantic Richfield Company (ARC) acquired Anaconda (Ref. 14, p. 7; Ref. 15, p. 15; Ref. 17, pp. 5, 8; Ref. 29, pp. 7-8; Ref. 35, pp. 16-17; Ref. 47, p. 36). During the 25-year operational history of Anaconda, nearly 360 million tons of ore were removed from the Yerington Pit, most of which remains as tailings piles or heap leach piles within the mine boundaries; approximately 1.7 billion pounds of copper were produced (Ref. 29, p. 8; Ref. 35, p. 16; Ref. 47, p. 36). In June 1978, ARC terminated mining operations at the former Anaconda Mine property and sold its interests to Don Tibbals, a local resident (Ref. 14, p. 7; Ref. 17, p. 5; Ref. 19, p. 7; Ref. 29, p. 8; Ref. 35, pp. 16-17; Ref. 47, p. 36). In 1988, Mr. Tibbals sold the majority of his portion of the original Anaconda property to Arimetco, Inc., which was headquartered in Arizona (Ref. 14, p. 7; Ref. 17, pp. 8; Ref. 19, p. 7; Ref. 29, p. 9; Ref. 35, pp. 16-17; Ref. 47, p. 36). In 2011, Singatse Peak Services LLC acquired all Arimetco assets (Ref. 15, p. 15).

Arimetco began leaching operations in 1989; over its operating period, Arimetco built and ran five lined HLPs (Ref. 19, pp. 7-8; Ref. 29, p. 20; Ref. 47, p. 36). After filing for Chapter 11 bankruptcy in January 1997, Arimetco continued its copper recovery operations through November 1999, when the property was shut down by the Nevada Division of Environmental Protection (NDEP) due to the company's inability to post the required reclamation bond (Ref. 4, p. 15; Ref. 6; Ref. 13, pp. 4 - 5; Ref. 14, p. 9). Arimetco abandoned the facility in January 2000, leaving the five operational HLPs with approximately 90 million gallons of pregnant leach solution (PLS) still in the system (Ref. 4, p. 15; Ref. 6; Ref. 13, pp. 4 - 5; Ref. 14, p. 9). Following the abandonment of the facility by Arimetco, the State of Nevada took over the facility cleanup activities and fluids system management on January 27, 2000 (Ref. 4, pp. 15, 38; Ref. 36, pp. 40–41). The flow rate in the system when the State took over was approximately 1,200 gallons per minute (gpm) (Ref. 6; Ref. 29, p. 24). The flow rate in 2014 was approximately 9.7 gpm (Ref. 7, p. 32).

Arimetco installed monitoring wells and leak detection systems as part of their permit to operate at the facility (Ref. 14, p. 9). Monitoring well sampling and status of the leak detection system were reported quarterly through November 1999 (Ref. 14, p. 9; Ref. 19, p. 31; Ref. 20, pp. 1-2) Quarterly monitoring indicated exceedance of maximum contaminant levels (MCLs) for arsenic, chromium, sulfate, copper, lead, and mercury at several shallow ground water monitoring wells on the facility (Ref. 14, p. 12; Ref. 20, pp. 1-2, 29-36). As of 1999, the facility was in violation of its discharge permits, due to the release of PLS from the HLPs (Ref. 4, p. 17; Ref. 14, p. 10; Ref. 20, pp. 2, 6, 9, 10, 14, 16, 17, 24-28; Ref. 28, p. 3). Leak-detection system data revealed that several detectors were reading leakage rates that were out of compliance, with two detectors reading leakage rates of over 2,000 gallons per day, and running annual average leakage rates of over 700 gallons per day each (Ref. 4, p. 17; Ref. 14, pp. 10, 12; Ref. 20, pp. 6, 9, 10, 14, 16, 17, 24-28; Ref. 28, p. 3).

Current activity by ARC includes fluid management associated with the Arimetco process components and the pumpback well system established in 1986 (Ref. 7, pp. 13-15; Ref. 29, p. 24). In addition, EPA has conducted several actions to repair Arimetco fluid collection ponds currently receiving drain-down fluids or to divert fluids to newly constructed evaporation ponds, as well as closure of inactive ponds (Ref. 7, pp. 12-15; Ref. 29, p. 24). EPA also removed and treated kerosene-contaminated soil at the Arimetco Raffinate pond by placing a bioremediation cell at the top of the Arimetco Phase IV Slot HLP (Ref. 29, p. 24).

In a U.S. Geological Survey (USGS) bulletin published in 1954, the former Anaconda Mine property was investigated as an area with elevated concentrations of naturally-occurring uranium. A sample collected from an unspecified tailings dump in 1948 indicated 0.03 percent triuranium octoxide. Geiger counts ranged from background to nearly four times the background, with an average slightly exceeding background levels (Ref. 29, p. 58; Ref. 48, pp. 29-30). In 1976, Kilborn/NUS Inc. issued a report to Wyoming Mineral Corporation evaluating the feasibility of a proposed uranium processing facility at the Yerington facility. The proposed uranium processing facility would be sufficient to produce approximately 50,000 pounds of triuranium octoxide as yellow cake uranium from 700 gpm of Yerington copper leach liquors (Ref. 29, p. 58). When the ore was processed for copper by Arimetco, it produced Technologically Enhanced Naturally Occurring Radioactive Material (TENORM), in which radioactive minerals were either concentrated above natural levels or moved from their natural location, causing an increased risk for exposure and offsite migration. TENORM has been identified within the former Anaconda Mine property including materials with elevated levels of radium-226, radium-228, thorium-230, thorium-232, and uranium-238 (Ref. 26, pp. 2; Ref. 29, p. 58).

SITE SOURCES

A total of 11 sources were evaluated for scoring the Anaconda Copper Mine site (see Figure 1). Detailed information about each source, with reference citations, is available in the following sections. Additional sources that may have also contributed to the release of hazardous substances at the site, but were not included in the site scoring are discussed in the Other Possible Sources Not Scored section.

Sources 1 through 5 are the five Arimetco HLPs. Sources 6 through 9 consist of evaporation ponds located in the northwest portion of the site that were used by Anaconda for evaporation of process solutions (Ref. 24, pp. 6-7; Ref. 39, pp. 23, 25-28, 50-51). Source 10 is the Sulfide Tailings Area in the northeast portion of the site, used by Anaconda for disposal of slurried sulfide tailings (Ref. 24, p. 8; Ref. 29, p. 52). Source 11 is the Oxide Tailings Area in the eastern portion of the site, used by Anaconda for disposal of oxide tailings from Anaconda's vat leach process (Ref. 24, p. 9; Ref. 29, pp. 55-56).

Hazardous substances associated with these sources include arsenic, cadmium, chromium, copper, lead, manganese, nickel, and/or zinc. Although uranium is documented in many of these sources (Ref. 4, pp. 79-80; Ref. 35, pp. 163, 166, 168-169, 171-172; Ref. 39, pp. 64-69), radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances.

Containment for Sources 1 through 5 includes liners with functioning leachate collection and removal systems. However, spills and leaks of PLS and raffinate have been documented from some of these sources (Ref. 20, pp. 6, 9, 14-15, 48; Ref. 28, p. 3; Ref. 29, pp. 21-22, 62, 64-65; Ref. 35, pp. 20-21; Ref. 36, pp. 27-31). Sources 6 through 9 are unlined or have deteriorating liners (Ref. 24, p. 6-8; Ref. 39, pp. 23, 25-28, 49-50). No liners have been observed for Sources 10 and 11 (Ref. 24. p. 9; Ref. 29, pp. 52-53; Ref. 37, pp. 86-103). Maintained engineered covers or functioning and maintained run-on control system and runoff management systems have not been observed for any of the 11 sources.

Anaconda Copper Mine Sources	
1	Arimetco Phase I/II HLP (OU-8)
2	Arimetco Phase III HLP (OU-8)
3	Arimetco Phase III 4X HLP (OU-8)
4	Arimetco Phase IV Slot HLP (OU-8)
5	Arimetco Phase IV VLT HLP (OU-8)
6	Lined Evaporation Pond (LEP) (OU-4)
7	Unlined Evaporation Pond (UEP) (OU-4)
8	Finger Evaporation Ponds (FEPs) 1-4 (OU-4)
9	Thumb Pond (FEP 5) (OU-4)
10	Sulfide Tailings Area (OU-4)
11	Oxide Tailings Area (OU-6)

SOURCE 1

2.2 SOURCE CHARACTERIZATION

Source 1 consists of the Arimetco Phase I/II HLP. This source is a tailings pile, constructed in 1989 by Arimetco to leach low grade oxide ore (Ref. 29, p. 21). The Phase I and Phase II HLPs are aggregated as a single source because the piles are contiguous, contain the same materials, and were constructed on the same liner (Ref. 29, p. 21; Ref. 36, p. 27). Hazardous substances associated with this source include arsenic, chromium, copper, lead, manganese, nickel, and zinc. Although uranium is documented in this source, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances (Ref. 4, p. 79; Ref. 35, pp. 166, 168, 171). Containment for Source 1 includes a liner with a functioning leachate collection and removal system, though spills of PLS have been documented (Ref. 29, p. 64[1]; Ref. 35, p. 20).

2.2.1 SOURCE IDENTIFICATION

Name of source: Arimetco Phase I/II HLP (OU-8) **Number of source:** 1

Source Type: Tailings Pile

Description and Location of Source (see Figure 1):

The Phase I HLP is located immediately north of the Yerington Pit and southeast of the Arimetco Solution Extraction/Electrowinning (SX/EW) Plant. The Phase II HLP is contiguous with Phase I, and extends to the north and west of Phase I (Figure 1; Ref. 36, p. 19). The Phase I/II HLPs are located entirely on private land (Ref. 36, p. 27).

The Phase I/II HLP was constructed by Arimetco beginning in 1989 to leach low-grade oxide ore from the original Anaconda W-3 Waste Rock Dump. Initial leaching ended in 1996 and resumed for approximately 5 months in early 1997. A solution ditch was constructed in the northeast corner of the HLPs, with leak detection points around the HLP and proximal to the SX/EW plant. Phase I covers approximately 6 acres and extends approximately 100 feet aboveground. The Phase II expansion extends west and north from Phase I and covers an additional 8 acres. A variable 2- to 10-foot-thick layer of vat leach tailings (VLT) was placed on a single 40-mil (0.04-inch-thick) high-density polyethylene (HDPE) liner. The 40-mil liner was placed over compacted alluvium and fill materials. A sump is located west of the HLP and was initially used as a sediment control basin for the Phase I HLP but now collects drain-down solution from the south end of the Phase I/II HLP. A large collection pond is located at the north end of the Phase I/II HLP that collects the drain-down solution from the perimeter ditches (Ref. 7, pp. 12, 30; Ref. 29, p. 21; Ref. 35, p. 20; Ref. 36, pp. 27-28; Ref. 44, pp. 18-19).

Materials in the Phase I/II HLPs consist of low-grade oxide ore (low-mica quartz monzonite with some oxide alteration on joint faces and replacement minerals, such as chlorite and trace metal sulfides) from the Anaconda W-3 Waste Rock dump. The VLT oxide tailings were placed on the bottom as drain rock. Maximum drain-down was 400 to 500 gpm in 1997 (Ref. 7, p. 30; Ref. 29,

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[1] This refers to the spill on November 15, 1997.

p. 25; Ref. 35, p. 23; Ref. 36, p. 27). Current drain-down is less than 0.25 gpm (Ref. 7, p. 30). The volume of materials in the Phase I/II HLP is approximately 1,076,000 cubic yards, estimated based on the topography and cross sections of the HLP (Ref. 35, pp. 71, 74, 220-221).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

2000 START Sampling

From October 19 through October 23, 2000, the Superfund Technical Assessment and Response Team (START), under the direction of EPA, conducted a sampling event at the former Anaconda Mine property. START collected tailings samples from the former tailings piles to identify the hazardous substances associated with these sources (Ref. 4, p. 18). Sampling was conducted in accordance with protocols described in a Sampling and Analysis Plan (SAP) approved by EPA (Ref. 4, p. 18). All samples were analyzed by EPA Region 9 Laboratory in Richmond, California for metals by EPA Method 6010. Total uranium and radionuclides were not analyzed. The data were validated by a START Basic Ordering Agreement subcontractor in accordance with EPA-approved procedures (Ref. 4, p. 18).

The tailings sample presented in the table below is representative of Arimetco Phase I/II HLP materials. Sample T-3 was collected from the northwest side of the Phase I/II HLP (Ref. 4, pp. 18-19).

Source 1 Sample Concentrations, mg/kg

Sample ID	Sample Descriptions	Date	Hazardous Substance	Hazardous Substance Concentration	Quantitation Limit	References
T-3	Tailings from the Arimetco Phase I HLP (solid sample).	10/19/2000	Chromium	6	2	Ref. 4, pp. 19, 51, 72-77, 79, 83-84
			Copper	2,400	4	
			Manganese	100	10	
			Zinc	14	4	

2007 CH2M Hill Sampling

In 2007 CH2MHill, under the direction of EPA, conducted a Remedial Investigation (RI) of the HLPs and their associated ponds. The field program objectives included characterization of HLP materials and drain-down solutions, and collection of sufficient data to evaluate the nature and extent of contamination associated with the HLPs. The work included collection of surface/subsurface samples for geotechnical, geochemical, and radiological analyses. Samples were collected in accordance with a Field Sampling Plan (FSP) and a Quality Assurance Project Plan (QAPP) approved by EPA in September 2007 (Ref. 35, p. 29; Ref. 49, p. 16).

Drilling and subsurface sampling of the HLPs were conducted between September 25 and October 17, 2007 by using a sonic drilling rig configured with an 8-inch diameter drill pipe and a 7-inch core. Composite samples were collected at 20-foot intervals; discrete samples were collected at specific depths. Composite sampling for chemical and radiological analysis was conducted by collecting an equal mass of HLP material every 20 feet over the sampling interval. Two borings were advanced on the Phase I/II HLP, with samples collected at 20, 40, and 60 feet below ground surface[2] (bgs) (Ref. 35, pp. 34-35; Ref. 49, pp. 13-14). Samples were analyzed for

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[2] Depths are reported in feet bgs instead of feet above mean sea level because they are collected within a HLP deposited over the natural ground surface.

metals through the EPA Contract Laboratory Program (CLP) following CLP Statement of Work ILM05.3 and ILM05.4 (Ref. 49, pp. 14-16). Samples were analyzed for isotopic uranium by ASTM D3972-90M (Ref. 49, p. 15-16).

Random surface sampling locations were found to be representative of surface visual and physical conditions of the area being sampled (Ref. 35, p. 36). Prior to surface sample collection, the upper 1 to 2 inches of HLP materials were scraped by using a decontaminated stainless steel trowel to expose a fresh surface (Ref. 35, p. 36). After approximately 3 square feet of “cemented” surface material had been removed to a depth of approximately 3 inches, a disposable trowel was used to collect and homogenize the HLP surface sample (Ref. 35, p. 36). HLP surface samples were collected to a maximum depth of 9 inches below the HLP surface (Ref. 35, p. 36). Four surface samples were collected from the Phase I/II HLP (Ref. 35, p. 37).

Sampling locations are presented in Figure 2 (Ref. 35, p. 42).

Source 1 Sample Concentrations

Sample ID (CLP ID)	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H12SU01 (MY3JT0)	0-50	10/11/2007	Chromium	5.7 J	1.0	Ref. 35, pp. 166, 168; Ref. 49, pp. 14-15, 67, 69; Ref. 52, pp. 4-5, 8, 10; Ref. 54, pp. 8, 10, 41, 51, 53
			Copper	1,080	2.5	
			Lead	3.0	1.0	
			Manganese	43.9 J	1.5	
			Uranium 234	0.996	0.221	
			Uranium 235	0.0642	0.0592	
			Uranium 238	0.874	0.204	
H12SU02 (MY3JT2)	50-77	10/10/2007	Chromium	3.9 J	1.0	Ref. 35, pp. 166, 168; Ref. 49, pp. 14-15, 67, 69; Ref. 52, pp. 4-5, 8, 10; Ref. 54, pp. 8, 12, 41, 51, 53
			Copper	955	2.5	
			Lead	2.7	1.0	
			Manganese	44.2 J	1.5	
			Uranium 234	0.849	0.201	
			Uranium 235	0.0816	0.0626	
			Uranium 238	0.727	0.183	
H12SS01 (MY3JQ8)	surface	10/23/2007	Arsenic	22.6	1.0	Ref. 35, pp. 166, 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, pp. 6, 9; Ref. 56, pp. 7, 11, 55, 60, 62
			Lead	6.1	1.0	
			Manganese	71.7	1.5	
			Nickel	6.5	4.0	
			Zinc	13.5	6.0	
H12SS02 (MY3JQ9)	surface	10/23/2007	Arsenic	21.4	1.0	Ref. 35, pp. 166, 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, pp. 6, 9; Ref. 56, pp. 7, 12, 55, 60, 62
			Lead	3.9	1.0	
			Manganese	78.4	1.5	
			Nickel	6.3	4.0	
			Zinc	13	6.0	

Source 1 Sample Concentrations

Sample ID (CLP ID)	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H12SS03 (MY3JR0)	surface	10/23/2007	Arsenic	9.1	1.0	Ref. 35, pp. 166, 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, pp. 6, 9; Ref. 56, pp. 7, 13, 55, 60, 62
			Lead	4.2	1.0	
			Manganese	28.7	1.5	
			Nickel	4.5	4.0	
			Zinc	7.3	6.0	
H12SS04 (MY3JR1)	surface	10/23/2007	Arsenic	12.5	1.0	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, pp. 6, 9; Ref. 56, pp. 7, 14, 55, 60, 62
			Lead	7	1.0	
			Manganese	33.8	1.5	
			Zinc	8.7	6.0	

J: concentrations may be biased high

*: Depths are reported in feet bgs instead of feet above mean sea level because they are collected within a HLP deposited over the natural ground surface.

CRQL: EPA Contract Laboratory Program Contract Required Quantitation Limit

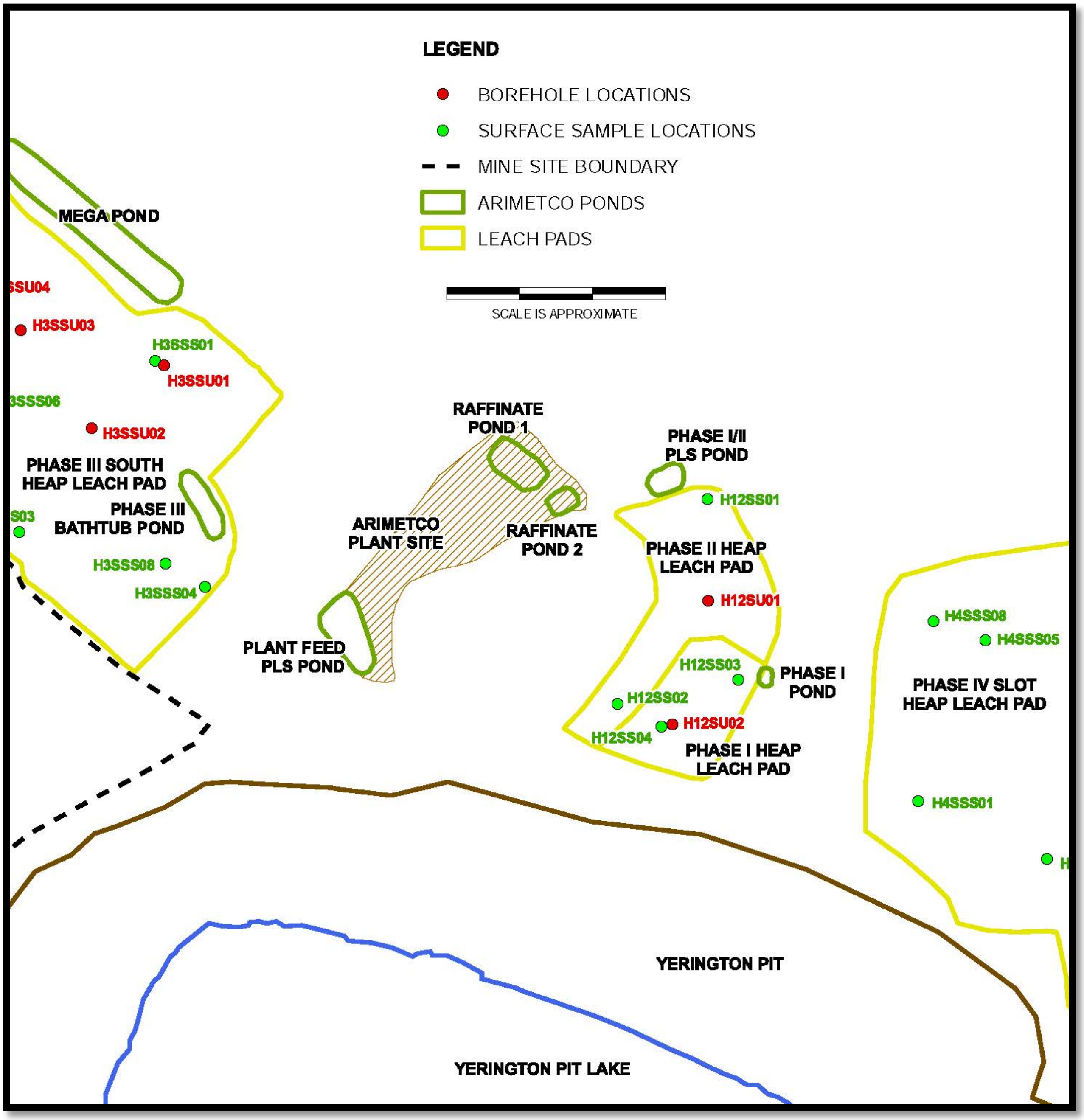

Figure 2: Phase I/II HLP (Source 1) 2007 RI Sampling Locations (Ref. 35, pp. 35, 37, 42)

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment Description	Containment Factor Value	References
Release to ground water: While a downgradient well is present, a background well is not available for comparison. Therefore, hazardous substance migration from this specific source has not been documented. However, a spill of PLS was documented. A liner with a functioning leachate collection and removal system is present. However, a maintained engineered cover and functioning and maintained run-on control system and runoff management system have not been observed.	10	Ref. 1, Table 3-2; Ref. 29, pp. 21, 64*; Ref. 35, p. 20; Ref. 36, pp. 27-28; Ref. 38, pp. 15, 17-18, 32, 37, 40, 42, 44-46, 55, 66, 91, 101

*: This Source is referred to as “Pad 1” in this reference.

2.4.2. Hazardous Waste Quantity

Insufficient information exists to evaluate hazardous constituent quantity and hazardous wastestream quantity. Therefore, the hazardous waste quantity value will be calculated using Tier C, the volume of the tailings pile (Ref. 1, Section 2.4.2.1, pp. 51590, 51591).

2.4.2.1.1 Hazardous Constituent Quantity (Tier A)

The hazardous constituent quantity for Source 1 could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1, pp. 51590-51591). There are insufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 1 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1, p. 51591).

Hazardous Constituent Quantity Value: Not Evaluated

2.4.2.1.2 Hazardous Wastestream Quantity (Tier B)

The hazardous wastestream quantity for Source 1 could not be adequately determined according to the HRS requirements; that is, the mass of the hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2, p. 51591). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of the wastestream plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 1 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, volume (Ref. 1, Section 2.4.2.1.2, p. 51591).

Hazardous Wastestream Quantity Value: Not Evaluated

2.4.2.1.3 Volume (Tier C)

CH2MHill calculated a volume for Source 1 of approximately 1,076,000 cubic yards, based on the topography and cross sections of the HLP (Ref. 35, pp. 71, 74, 220-221). However, sufficient information to reproduce this calculation was not provided in the reference. The Phase I/II HLP covers an area of approximately 14 acres (Ref. 7, p. 12; Ref. 29, p. 21; Ref. 35, pp. 20, 23; Ref. 36, p. 27). The top-deck of the Phase I/II HLP occupies approximately 3 acres (Ref. 35, pp. 20, 23; Ref. 36, p. 28). However, sufficient information regarding the height of the tailings to calculate the volume for Source 1 with reasonable confidence was not available. Scoring proceeds to the evaluation of Tier D, area (Ref. 1, Section 2.4.2.1.3, p. 51591).

Volume Assigned Value: 0

2.4.2.1.4 Area (Tier D)

The Phase I/II HLP covers an area of approximately 14 acres (Ref. 7, p. 12; Ref. 29, p. 21; Ref. 35, pp. 20, 23; Ref. 36, p. 27).

14 acres = 609,840 square feet
609,840 / 13 = 46,910.8 (Ref. 1, Table 2-5, p. 51591)

Area Assigned Value: 46,910.8

Source Hazardous Waste Quantity Value

According to the Hazard Ranking System (HRS) final rule, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) is assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

Tier Evaluated	Source 1 Values
A	NE
B	NE
C	0
D	46,910.8*

Notes:
* Value selected for the source hazardous waste quantity, according to the HRS.
NE Not Evaluated.

Source Hazardous Waste Quantity Value: 46,910.8

SOURCE 2

2.2 SOURCE CHARACTERIZATION

Source 2 consists of the Arimetco Phase III South HLP. This source is a tailings pile, constructed between 1990 and 1992 to leach low-grade oxide ore from the former Anaconda W-3 Waste Rock Dump, some VLT material, and mined material from the MacArthur Pit (Ref. 29, p. 21). The MacArthur pit is located approximately 2 miles northwest of the Anaconda site sources (Ref. 23, p. 234). Hazardous substances associated with this source include arsenic, chromium, copper, lead, manganese, nickel, and zinc. Although uranium is documented in this source, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances (Ref. 4, p. 79; Ref. 35, pp. 166, 168, 171). Containment for Source 2 includes a liner with a functioning leachate collection and removal system (Ref. 29, p. 21; Ref. 35, p. 20).

2.2.1 SOURCE IDENTIFICATION

Name of source: Arimetco Phase III South HLP (OU-8) **Number of source:** 2

Source Type: Tailings Pile

Description and Location of Source (see Figure 1):

The Arimetco Phase III South HLP is located north of the paved access road and northwest of the Arimetco Plant (Figure 1; Ref. 36, p. 19). The Phase III South HLP is primarily located on private land, and approximately 6 acres of the eastern portion of the pad is located on public land controlled by the Bureau of Land Management (BLM) (Ref. 36, pp. 29-30). The volume of materials in the Phase III South HLP is 5,453,000 cubic yards, estimated based on the topography and cross sections of the HLP (Ref. 35, pp. 71, 74, 220, 223).

The Phase III South HLP covers approximately 46 acres, and was constructed between 1990 and 1992 to leach low-grade oxide ore from the former Anaconda W-3 Waste Rock Dump, some VLT material, and mined material from the MacArthur Pit (Ref. 7, p. 12; Ref. 29, p. 21; Ref. 35, p. 20; Ref. 36, pp. 29-30). Leaching originally ended in early 1997 but resumed for several months in 1998 (Ref. 29, p. 21; Ref. 35, p. 21). The Phase III South HLP includes a secondary liner of compacted naturally-occurring clayey material (Ref. 29, p. 21; Ref. 36, p. 29). A single 40-mil HDPE liner was constructed for solution recovery, and a drainage ditch surrounding the Phase III South HLP was constructed with a polynet leak-detection system over a second 40-mil HDPE membrane (Ref. 7, p. 12; Ref. 29, p. 21; Ref. 35, p. 20; Ref. 36, pp. 29-30). The solution ditch drained to the Bathtub Pond or the Mega Pond (Ref. 7, p. 12; Ref. 35, p. 20; Ref. 36, p. 29). In 2006 and 2007, EPA installed interceptor trenches and French drains to divert the drain-down solution to a new 4-acre evaporation pond (Ref. 29, p. 21). Use of the 4-Acre Pond was discontinued because it had become filled with mineral salt precipitates, and two new evaporation ponds (Ponds B and C) were constructed and placed into service in October 2013 (Ref. 7, pp. 15, 30).

The Phase III South HLP consists of low-grade oxide ore from the Anaconda W-3 Waste Rock Dump (low-mica quartz monzonite with some oxide alteration on joint faces and replacement minerals, such as chlorite, and trace metal sulfides) and MacArthur Pit run-of-mine and crushed ore (quartz monzonite with replacement minerals, such as chlorite, and trace metal sulfides). VLT oxide tailings (2 to 10 feet thick) were placed on the bottom as drain rock. Maximum drain-down was 400 to 500 gpm in 1998 (Ref. 29, p. 25). In 2014, the drain-down volume from both the Phase III South HLP and the Phase III 4X HLP (Source 3) was 1,753,684 gallons, or an annual average of about 3.3 gpm. The monthly drain-down volumes ranged from 99,865 to 225,012 gallons and monthly average flow rates ranged from 2.2 to 5.0 gpm (Ref. 7, p. 30).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

2000 START Sampling

From October 19 through October 23, 2000, START, under the direction of EPA, conducted a sampling event at the facility. START collected tailings samples from the former tailings piles to identify the hazardous substances associated with these sources. Sampling was conducted in accordance with protocols described in a SAP approved by EPA. All samples were analyzed by EPA Region 9 Laboratory in Richmond, California for metals by EPA Method 6010. Total uranium and radionuclides were not analyzed. The data were validated by a START Basic Ordering Agreement subcontractor in accordance with EPA-approved procedures (Ref. 4, p. 18).

The tailings sample presented in the table below is representative of Arimetco Phase III South HLP materials. Sample T-5 was collected from the north side of the Phase III South HLP, adjacent to the north end of the Megapond (see Figure 4 for Megapond location) (Ref. 4, pp. 18-19).

Source 2 Sample Concentrations, mg/kg

Sample ID	Sample Descriptions	Date	Hazardous Substance	Hazardous Substance Concentration	Quantitation Limit	References
T-5	Tailings from the Arimetco Phase III Leach Pad (solid sample).	10/19/2000	Arsenic	10	2	Ref. 4, pp. 19*, 51*, 72-75, 79, 84
			Chromium	6	2	
			Copper	1,000	4	
			Manganese	50	10	
			Zinc	16	4	

*: The source is erroneously labeled “Phase II HLP on these reference pages.

2007 CH2MHill Sampling

In 2007 CH2MHill, under the direction of EPA, conducted a RI field investigation of the HLPs and their associated ponds. The field program objectives included characterization of HLP materials and drain-down solutions, and collection of sufficient data to evaluate the nature and extent of contamination associated with the HLPs. The work included collection of surface/subsurface samples for geotechnical, geochemical, and radiological analyses. Samples were collected in accordance with a FSP and a QAPP approved by EPA in September 2007 (Ref. 35, p. 29).

Drilling and subsurface sampling of the HLPs were conducted between September 25 and October 17, 2007 by using a sonic drilling rig configured with an 8-inch diameter drill pipe and a 7-inch core (Ref. 35, p. 34). Composite samples were collected at 20-foot intervals; discrete samples were collected at specific depths. Composite sampling for chemical and radiological analysis was conducted by collecting an equal mass of HLP material every 20 feet over the sampling interval. Four borings were advanced on the Phase III South HLP (Ref. 35, p. 34; Ref. 49, pp. 13-14). Samples were analyzed for metals through the EPA CLP following CLP Statement of Work ILM05.3 and ILM05.4 (Ref. 49, pp. 14-16). Samples were analyzed for isotopic uranium by ASTM D3972-90M (Ref. 49, p. 15-16).

Random surface sampling locations were found to be representative of surface visual and physical conditions of the area being sampled (Ref. 35, p. 36). Prior to surface sample collection, the upper 1 to 2 inches of HLP materials were scraped by using a decontaminated stainless steel trowel to expose a fresh surface (Ref. 35, p. 36). After approximately 3 square feet of "cemented" surface material had been removed to a depth of approximately 3 inches, a disposable trowel was used to collect and homogenize the HLP surface sample (Ref. 35, p. 36). HLP surface samples were collected to a maximum depth of 9 inches below the HLP surface (Ref. 35, p. 36). Four surface samples were collected from the Phase I/II HLP (Ref. 35, p. 37).

Sampling locations are presented in Figure 3 (Ref. 35, p. 42).

Source 2 Sample Concentrations

Sample ID (CLP ID)	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H3SSU01 (MY3JT3)	0-50	9/25/2007	Chromium	4.3	1	Ref. 35, p. 168; Ref. 49, pp. 14-15, 69; Ref. 57, pp. 8-9, 25, 34-35
			Copper	947	2.5	
			Lead	3.8	1	
			Manganese	42.9	1.5	
H3SSU01	20-97	9/25/2007	Uranium 234	1.63	0.313	Ref. 35, p. 166; Ref. 49, pp. 15, 67
			Uranium 238	1.46	0.289	
H3SSU02	0-50	10/7/2007	Uranium 234	1.28	0.262	Ref. 35, p. 166; Ref. 49, pp. 15, 67
			Uranium 235	0.0923	0.0664	
			Uranium 238	1.33	0.27	
H3SSU02 (MY3JT4)	50-100	10/7/2007	Chromium	4.6	1	Ref. 35, p. 168; Ref. 49, pp. 14-15, 69; Ref. 52, pp. 4-5, 8; Ref. 54, pp. 8, 13, 41, 51, 53
			Copper	619	2.5	
			Lead	3	1	
			Manganese	59.1	1.5	
H3SSU03	50-100	10/6/2007	Uranium 234	1.27	0.242	Ref. 35, p. 166; Ref. 49, pp. 15, 67
			Uranium 235	0.0625	0.0503	
			Uranium 238	1.23	0.235	
H3SSU03 (MY3JT5)	100-117	10/6/2007	Chromium	7.7	1	Ref. 35, p. 168; Ref. 49, pp. 14-15, 69; Ref. 52, pp. 4-5, 8; Ref. 54, pp. 8, 14, 41, 51, 53
			Copper	905	2.5	
			Lead	2.5	1	
			Manganese	65	1.5	
H3SSU04	0-50	9/26/2007	Uranium 234	1.5	0.311	Ref. 35, p. 166, 171; Ref. 49, pp. 15, 67
			Uranium 235	0.134	0.0911	
			Uranium 238	1.38	0.294	

Source 2 Sample Concentrations

Sample ID (CLP ID)	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H3SSU04 (MY3JT6)	50-100	9/26/2007	Chromium	4.8	1	Ref. 35, p. 168, 171; Ref. 49, pp. 14-15, 69; Ref. 57, pp. 8, 10, 25, 34-35
			Copper	831	2.5	
			Lead	2.6	1	
			Manganese	51	1.5	
H3SSS01 (MY3JR2)	surface	10/24/2007	Arsenic	9.8	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 6; Ref. 56, pp. 7, 15, 55, 60, 62
			Lead	4.6	1	
			Manganese	81.9	1.5	
			Nickel	5.4	4	
			Zinc	14.6	6	
H3SSS02 (MY3JR3)	surface	10/25/2007	Arsenic	18.4	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 6; Ref. 56, pp. 7, 16, 55, 60, 62
			Lead	5.5	1	
			Manganese	64.7	1.5	
			Nickel	6.1	4	
			Zinc	13.4	6	
H3SSS03 (MY3JR4)	surface	10/25/2007	Arsenic	14.8	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 7; Ref. 56, pp. 7, 17, 55, 60, 62
			Lead	4.3	1	
			Manganese	68.5	1.5	
			Nickel	7.6	4	
			Zinc	10.6	6	
H3SSS04 (MY3JR5)	surface	10/25/2007	Arsenic	2.6	1	Ref. 35, pp. 166, 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 7; Ref. 56, pp. 7, 18, 55, 60, 62
			Lead	1.8	1	
			Manganese	32.3	1.5	
			Nickel	5.6	4	
			Zinc	11.4	6	
H3SSS05 (MY3JR6)	surface	10/24/2007	Arsenic	11.3	1	Ref. 35, pp. 166, 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 7; Ref. 56, pp. 7, 19, 55, 60, 62
			Lead	5.7	1	
			Manganese	37.8	1.5	
			Zinc	10.8	6	
H3SSS06 (MY3JR7)	surface	10/25/2007	Arsenic	11.4	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 7; Ref. 56, pp. 7, 20, 55, 60, 62
			Lead	6.7	1	
			Manganese	41.2	1.5	
			Zinc	13.1	6	
H3SSS07 (MY3JR8)	surface	10/24/2007	Arsenic	10.6	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 7; Ref. 56, pp. 7, 21, 55, 60, 62
			Lead	5.7	1	
			Manganese	98.1	1.5	
			Nickel	7.6	4	
			Zinc	21.2	6	

Source 2 Sample Concentrations

Sample ID (CLP ID)	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H3SSS08 (MY3JR9)	surface	10/24/2007	Arsenic	11.6	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 7; Ref. 56, pp. 7, 22, 55, 60, 62
			Lead	3.2	1	
			Manganese	43.6	1.5	
			Zinc	10.9	6	

*: Depths are reported in feet bgs instead of feet above mean sea level because they are collected within a HLP deposited over the natural ground surface.

CRQL: EPA Contract Laboratory Program Contract Required Quantitation Limit

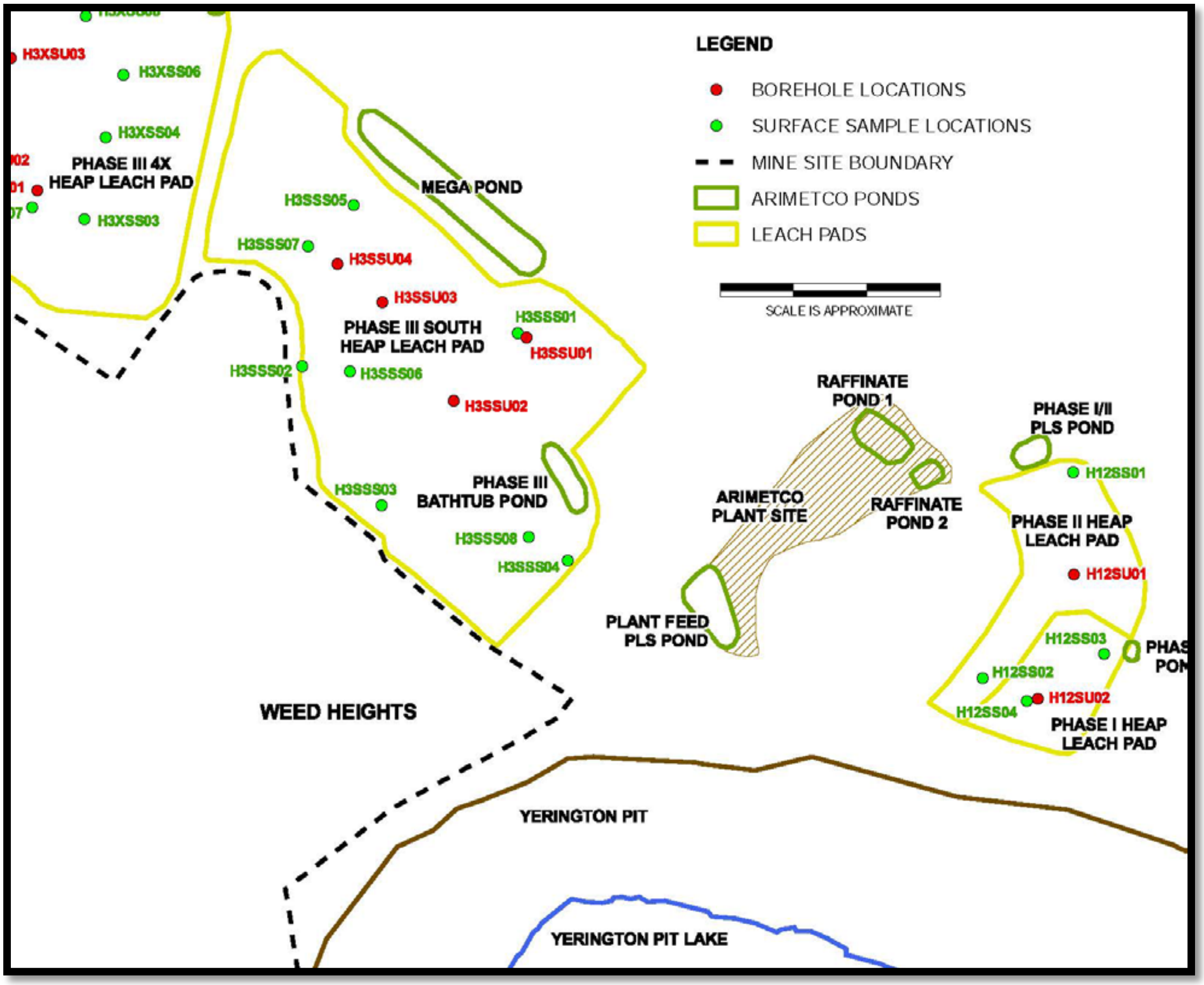

Figure 3: Phase III South HLP 2007 RI Sampling Locations (Ref. 35, pp. 35, 37, 42)

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment Description	Containment Factor Value	Ref.
Ground water pathway: Arimetco abandoned operations at the facility in December 1999, leaving 90 million gallons of PLS in the HLP ponds and tailings. There are no covers over the Phase III HLPs. A liner with a functioning leachate collection and removal system is present. A maintained engineered cover and functioning and maintained run-on control system and runoff management system have not been observed. Monitoring wells are not present in appropriate locations to document hazardous substance migration from this individual source.	9	Ref. 1, Table 3-2; Ref. 4, p. 33; Ref. 6; Ref. 29, p. 21

2.4.2. Hazardous Waste Quantity

Insufficient information exists to evaluate hazardous constituent quantity and hazardous wastestream quantity. Therefore, the hazardous waste quantity value will be calculated using Tier C, the volume of the tailings pile (Ref. 1, Section 2.4.2.1, pp. 51590, 51591).

2.4.2.1.1 Hazardous Constituent Quantity (Tier A)

The hazardous constituent quantity for Source 2 could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1, pp. 51590-51591). There are insufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 1 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1, p. 51591).

Hazardous Constituent Quantity Value: Not Evaluated

2.4.2.1.2 Hazardous Wastestream Quantity (Tier B)

The hazardous wastestream quantity for Source 2 could not be adequately determined according to the HRS requirements; that is, the mass of the hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2, p. 51591). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of the wastestream plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 1 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, volume (Ref. 1, Section 2.4.2.1.2, p. 51591).

Hazardous Wastestream Quantity Value: Not Evaluated

2.4.2.1.3 Volume (Tier C)

CH2MHill calculated a volume for Source 2 of approximately 5,453,000 cubic yards, based on the topography and cross sections of the HLP (Ref. 35, pp. 71, 74, 220, 223). However, sufficient information to reproduce this calculation was not provided in the reference. The Phase III South HLP covers approximately 46 acres (Ref. 7, p. 12; Ref. 29, p. 21; Ref. 35, pp. 20, 23; Ref. 36, p. 30). The top deck is generally flat and covers approximately 15 acres in two benches (Ref. 35, pp. 20, 23; Ref. 36, p. 30). However, sufficient information regarding the height of the tailings to calculate the volume for Source 2 with reasonable confidence was not available. Scoring proceeds to the evaluation of Tier D, area (Ref. 1, Section 2.4.2.1.3, p. 51591).

Volume Assigned Value: 0

2.4.2.1.4 Area (Tier D)

The Phase III South HLP covers approximately 46 acres (Ref. 7, p. 12; Ref. 29, p. 21; Ref. 35, pp. 20, 23; Ref. 36, p. 30).

46 acres = 2,003,760 square feet
2,003,760 / 13 = 154,135.4 (Ref. 1, Table 2-5, p. 51591)

Area Assigned Value: 154,135.4

Source Hazardous Waste Quantity Value

According to the Hazard Ranking System (HRS) final rule, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) is assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

Tier Evaluated	**Source 2 Values**
A	NE
B	NE
C	0
D	154,135.4*

Note:

*	Value selected for the source hazardous waste quantity, according to the HRS.
NE	Not Evaluated.

Source Hazardous Waste Quantity Value: 154,135.4

SOURCE 3

Source 3 consists of the Arimetco Phase III 4X HLP. This source is a tailings pile, constructed between 1992 and 1995 to leach low-grade oxide ore from the W-3 Waste Rock dump, some VLT material, and mined material from the MacArthur Pit (Ref. 29, p. 21). The MacArthur pit is located approximately 2 miles northwest of the Anaconda site sources (Ref. 23, p. 234). Hazardous substances associated with this source include arsenic, chromium, copper, lead, manganese, nickel, and zinc. Although uranium is documented in this source, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances (Ref. 35, pp. 166, 168, 171). Containment for Source 3 includes a liner with a functioning leachate collection and removal system, though leaks of PLS have been documented (Ref. 20, pp. 6, 14-15; Ref. 28, p. 3[3]; Ref. 29, pp. 21, 62[4]; Ref. 35, p. 20).

2.2.1 SOURCE IDENTIFICATION

Name of source: Arimetco Phase III 4X HLP (OU-8) **Number of source:** 3

Source Type: Tailings Pile

Description and Location of Source (see Figure 1):

The Arimetco Phase III 4X HLP is located north of the paved access road and northwest of the Arimetco Plant (Figure 1; Ref. 36, p. 19). The Phase III 4X HLP is evenly divided between private and public land, with the public land constituting the central and southwestern portions of the pad (Ref. 36, pp. 29-30). The volume of materials in the Phase III 4X HLP is 5,215,000 cubic yards, estimated based on the topography and cross sections of the HLP (Ref. 35, pp. 71, 74, 220, 222).

The Phase III 4X HLP covers approximately 50 acres and was constructed between 1992 and 1995 to leach low-grade oxide ore from the W-3 Waste Rock dump, some VLT material, and mined material from the MacArthur Pit. Leaching ended in 1999. Solution from the Phase III 4X HLP solution ditch drains to a low point near the southeast corner of the pad (Ref. 29, p. 21; Ref. 35, p. 20; Ref. 36, p. 29).

The Phase III 4X HLP consists of low-grade oxide ore from the Anaconda W-3 Waste Rock dump (low-mica quartz monzonite with some oxide alteration on joint faces and replacement minerals, such as chlorite, and trace metal sulfides) and MacArthur Pit run-of-mine and crushed ore (quartz monzonite with replacement minerals, such as chlorite, and trace metal sulfides). VLT oxide tailings (2 to 10 feet thick) were placed on the bottom as drain rock. Maximum drain-down was 1,620 gpm (Ref. 29, p. 25). In 2014, the drain-down volume for both the Phase III South HLP and the Phase III 4X HLP was 1,753,684 gallons, or an annual average of about 3.3 gpm. The monthly drain-down volumes ranged from 99,865 to 225,012 gallons and monthly average flow rates ranged from 2.2 to 5.0 gpm (Ref. 7, p. 30).

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[3] Monitoring locations for this Source are IIIF1, IIIF2, and IIIFX (Ref. 20, p. 6).
[4] This refers to the 4/3/1992 spill indicated on Ref. 29, p. 62.

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

2007 CH2MHill Sampling

In 2007 CH2MHill, under the direction of EPA, conducted a RI field investigation of the HLPs and their associated ponds. The field program objectives included characterization of HLP materials and drain-down solutions, and collection of sufficient data to evaluate the nature and extent of contamination associated with the HLPs. The work included collection of surface/subsurface samples for geotechnical, geochemical, and radiological analyses. Samples were collected in accordance with a FSP and a QAPP approved by EPA in September 2007 (Ref. 35, p. 29).

Drilling and subsurface sampling of the HLPs were conducted between September 25 and October 17, 2007 by using a sonic drilling rig configured with an 8-inch diameter drill pipe and a 7-inch core. Composite samples were collected at 20-foot intervals; discrete samples were collected at specific depths. Composite sampling for chemical and radiological analysis was conducted by collecting an equal mass of HLP material every 20 feet over the sampling interval. Three borings were advanced on the Phase III 4X HLP. Samples were analyzed for metals by EPA Region 9 Laboratory (Ref. 35, pp. 34-35; Ref. 49, pp. 13-14). Samples were analyzed for metals through the EPA CLP following CLP Statement of Work ILM05.3 and ILM05.4 (Ref. 49, pp. 14-16). Samples were analyzed for isotopic uranium by ASTM D3972-90M (Ref. 49, p. 15-16).

Random surface sampling locations were found to be representative of surface visual and physical conditions of the area being sampled (Ref. 35, p. 36). Prior to surface sample collection, the upper 1 to 2 inches of HLP materials were scraped by using a decontaminated stainless steel trowel to expose a fresh surface (Ref. 35, p. 36). After approximately 3 square feet of "cemented" surface material had been removed to a depth of approximately 3 inches, a disposable trowel was used to collect and homogenize the HLP surface sample (Ref. 35, p. 36). HLP surface samples were collected to a maximum depth of 9 inches below the HLP surface (Ref. 35, p. 36). Four surface samples were collected from the Phase I/II HLP (Ref. 35, p. 37).

Sampling locations are presented in Figure 4 (Ref. 35, p. 42).

Source 3 Sample Concentrations

Sample ID	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H3XSU01 (MY3JT7)	0-50	10/16/2007	Chromium	3	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 69; Ref. 50, pp. 8-9, 29, 39-40
			Copper	1,570	2.5	
			Lead	2 J	1	
			Manganese	55.5	1.5	
H3XSU01	50-67	10/16/2007	Uranium 234	1.28	0.256	Ref. 35, p. 166; Ref. 49, pp. 15, 67
			Uranium 235	0.0471	0.047	
			Uranium 238	1.24	0.249	

Source 3 Sample Concentrations

Sample ID	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H3XSU02	0-50	10/16/2007	Uranium 234	1.68	0.307	Ref. 35, p. 166; Ref. 49, pp. 15, 67
			Uranium 235	0.0623	0.0543	
			Uranium 238	1.21	0.244	
H3XSU02 (MY3JT8)	50-67	10/17/2007	Arsenic	3.7	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 69; Ref. 50, pp. 8, 10, 29, 39-40
			Chromium	2.7	1	
			Copper	554	2.5	
			Manganese	35.2	1.5	
H3XSU03 (MY3JT9)	50-67	10/17/2007	Arsenic	7.5	1	Ref. 35, pp. 166, 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 50, pp. 8, 11, 29, 39-40
			Chromium	8.2	1	
			Copper	2,060	2.5	
			Lead	2.5	1	
			Manganese	73	1.5	
			Uranium 234	2.5	0.399	
			Uranium 235	0.154	0.0755	
			Uranium 238	2.04	0.34	
H3XSS01 (MY3JS0)	surface	10/25/2007	Arsenic	12.0	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 8; Ref. 56, pp. 8, 23, 55, 60, 62
			Lead	3.4	1	
			Manganese	118	1.5	
			Nickel	12.1	4	
			Zinc	12.2	6	
H3XSS02 (MY3JS1)	surface	10/25/2007	Arsenic	24.8	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 8; Ref. 56, pp. 8, 24, 55, 60, 62
			Lead	6	1	
			Manganese	123	1.5	
			Nickel	9.4	4	
			Zinc	24.2	6	
H3XSS03 (MY3JS2)	surface	10/25/2007	Arsenic	7.8	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 8; Ref. 56, pp. 8, 25, 55, 60, 62
			Lead	5.5	1	
			Manganese	55.2	1.5	
			Nickel	7.5	4	
			Zinc	13.2	6	
H3XSS04 (MY3JS3)	surface	10/25/2007	Arsenic	6.8	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 8; Ref. 56, pp. 8, 26, 55, 60, 62
			Lead	6.5	1	
			Manganese	32.9	1.5	
			Nickel	5	4	
			Zinc	9.3	6	
H3XSS05 (MY3JS4)	surface	10/25/2007	Arsenic	13	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 8; Ref. 56, pp. 8, 27, 55, 60, 62
			Lead	6.7	1	
			Manganese	41.8	1.5	
			Zinc	8.3	6	

Source 3 Sample Concentrations

Sample ID	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H3XSS06 (MY3JS5)	surface	10/25/2007	Arsenic	19.4	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 8; Ref. 56, pp. 8, 28, 55, 60, 62
			Lead	53.2	1	
			Manganese	125	1.5	
			Nickel	11.5	4	
			Zinc	23.5	6	
H3XSS07 (MY3JS6)	surface	10/25/2007	Arsenic	9.3	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 8; Ref. 56, pp. 8, 29, 55, 60, 62
			Lead	7.9	1	
			Manganese	48.7	1.5	
			Nickel	6	4	
			Zinc	12.2	6	
H3XSS08 (MY3JS7)	surface	10/25/2007	Arsenic	7.7	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 55, p. 8; Ref. 56, pp. 8, 30, 55, 60, 62
			Lead	4.9	1	
			Manganese	56	1.5	
			Nickel	7.1	4	
			Zinc	14.5	6	
H3SSS05 (MY3JR6)	surface	10/24/2007	Arsenic	11.3	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 56, pp. 7, 19, 55, 60, 62
			Lead	5.7	1	
			Manganese	37.8	1.5	
			Zinc	10.8	6	
H3SSS06 (MY3JR7)	surface	10/25/2007	Arsenic	11.4	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 56, pp. 7, 20, 55, 60, 62
			Copper	518 J	1	
			Lead	6.7	1.5	
			Manganese	41.2	4	
			Zinc	13.1	6	
H3SSS07 (MY3JR8)	surface	10/24/2007	Arsenic	10.6	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 56, pp. 8, 21, 55, 60, 62
			Lead	5.7	1	
			Manganese	98.1	1.5	
			Nickel	7.6	4	
			Zinc	21.2	6	
H3SSS08 (MY3JR9)	surface	10/24/2007	Arsenic	11.6	1	Ref. 35, pp. 168, 171; Ref. 49, pp. 14-15, 67, 69; Ref. 56, pp. 8, 22, 55, 60, 62
			Lead	3.2	1	
			Manganese	43.6	1.5	
			Zinc	10.9	6	

*: Depths are reported in feet bgs instead of feet above mean sea level because they are collected within a HLP deposited over the natural ground surface.

CRQL: EPA Contract Laboratory Program Contract Required Quantitation Limit

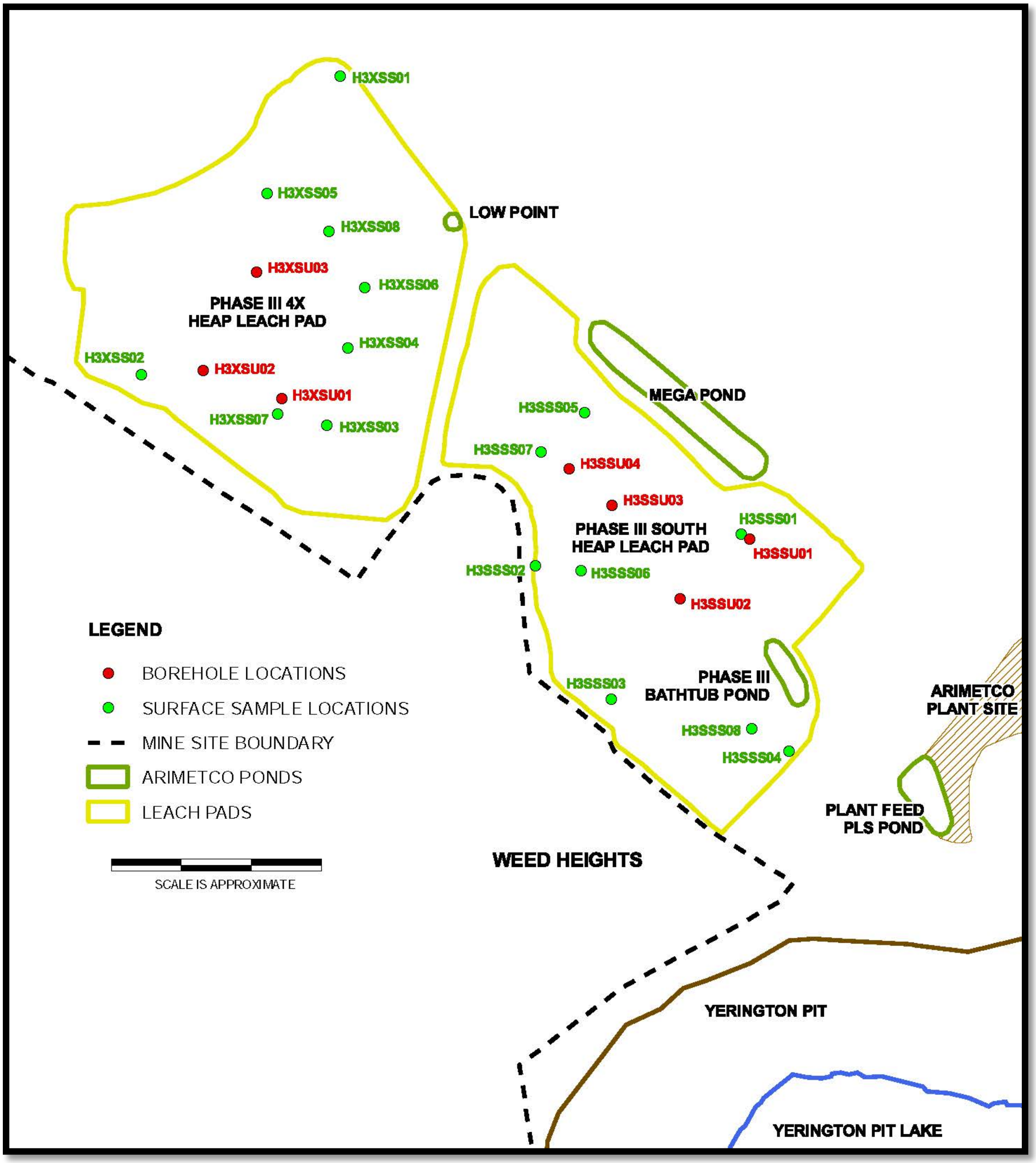

Figure 4: Phase III 4X HLP 2007 RI Sampling Locations (Ref. 35, pp. 35, 37-38, 42)

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment Description	Containment Factor Value	Ref.
Ground water pathway: Arimetco abandoned operations at the facility in December 1999, leaving 90 million gallons of PLS in the HLP ponds and tailings. There are no covers over the Phase III HLPs. A liner with a functioning leachate collection and removal system is present. A maintained engineered cover and functioning and maintained run-on control system and runoff management system are not present. Leaks of PLS have been documented. Monitoring wells are not present in appropriate locations to document hazardous substance migration from this individual source.	10	Ref. 1, Table 3-2; Ref. 6; Ref. 20, pp. 6*, 14-15; Ref. 28, p. 3**; Ref. 29, pp. 21, 62*, 65* Ref. 35, p. 20; Ref. 36, pp. 29-31

*: Alternative names for this source in these references include "FX Phase III Pad" and "PIII-X".

**: Monitoring locations for this Source are IIIF1, IIIF2, and IIIFX (Ref. 20, p. 6).

2.4.2. Hazardous Waste Quantity

Insufficient information exists to evaluate hazardous constituent quantity and hazardous wastestream quantity. Therefore, the hazardous waste quantity value will be calculated using Tier C, the volume of the tailings pile (Ref. 1, Section 2.4.2.1, pp. 51590, 51591).

2.4.2.1.1 Hazardous Constituent Quantity (Tier A)

The hazardous constituent quantity for Source 3 could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1, pp. 51590-51591). There are insufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 1 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1, p. 51591).

Hazardous Constituent Quantity Value: Not Evaluated

2.4.2.1.2 Hazardous Wastestream Quantity (Tier B)

The hazardous wastestream quantity for Source 3 could not be adequately determined according to the HRS requirements; that is, the mass of the hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2, p. 51591). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of the wastestream plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 3 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, volume (Ref. 1, Section 2.4.2.1.2, p. 51591).

Hazardous Wastestream Quantity Value: Not Evaluated

2.4.2.1.3 Volume (Tier C)

CH2MHill calculated a volume for Source 3 of approximately 5,215,000 cubic yards, based on the topography and cross sections of the HLP (Ref. 35, pp. 71, 74, 220, 223). However, sufficient information to reproduce this calculation was not provided in the reference. The Phase III 4X HLP covers approximately 50 acres (Ref. 29, p. 21; Ref. 35, pp. 20, 23; Ref. 36, p. 30). A generally flat surface of approximately 22 acres exists at the top of the HLP in three benches (Ref. 35, pp. 20, 23; Ref. 36, p. 30). However, sufficient information regarding the height of the tailings to calculate the volume for Source 3 with reasonable confidence was not available. Scoring proceeds to the evaluation of Tier D, area (Ref. 1, Section 2.4.2.1.3, p. 51591).

Volume Assigned Value: 0

2.4.2.1.4 Area (Tier D)

The Phase III 4X HLP covers approximately 50 acres (Ref. 29, p. 21; Ref. 35, pp. 20, 23; Ref. 36, p. 30).

50 acres = 2,178,000 square feet
2,178,000 / 13 = 167,538.5 (Ref. 1, Table 2-5, p. 51591)

Area Assigned Value: 167,538.5

Source Hazardous Waste Quantity Value

According to the Hazard Ranking System (HRS) final rule, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) is assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

Tier Evaluated	Source 3 Values
A	NE
B	NE
C	0
D	167,538.5*

Note:

* Value selected for the source hazardous waste quantity, according to the HRS.
NE Not Evaluated.

Source Hazardous Waste Quantity Value: 167,538.5

SOURCE 4

Source 4 consists of the Arimetco Phase IV Slot HLP. This source is a tailings pile, initially constructed by Arimetco on a starter pad excavated into the Anaconda W-3 Waste Rock Dump. Between 1993 and 1996, Arimetco continually mined the W-3 dump ore back into the growing Phase IV Slot HLP (Ref. 29, p. 22). Hazardous substances associated with this source include arsenic, chromium, copper, lead, manganese, nickel, and zinc. Although uranium is documented in this source, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances (Ref. 4, p. 79; Ref. 35, pp. 166, 168, 172). Containment for Source 4 includes a liner with a functioning leachate collection and removal system, though leaks of PLS have been documented (Ref. 20, pp. 6, 8-9; Ref. 28, p. 3[5]; Ref. 29, pp. 21-22; Ref. 35, p. 21).

2.2.1 SOURCE IDENTIFICATION

Name of source: Arimetco Phase IV Slot HLP (OU-8) **Number of source:** 4

Source Type: Tailings Pile

Description and Location of Source (see Figure 1):

The Phase IV Slot HLP borders the eastern property boundary northeast of the Yerington Pit and includes a portion of the W-3 Waste Rock Area that was previously leached by Anaconda (Ref. 36, p. 19). The majority of this HLP was constructed on public land, with portions of the west and south slopes on private land (Ref. 29, p. 22; Ref. 36, p. 32).

The Phase IV Slot HLP was initially constructed by Arimetco on a starter pad excavated into the Anaconda W-3 Waste Rock Dump. The HLP expanded northward between 1993 and 1998 and includes a primary 40-mil HDPE liner overlying a secondary liner of compacted, naturally occurring, gray, lean clay. The solution drainage ditch is designed with a leak detection system over a second 40-mil HDPE membrane. A variable 2- to 10-foot-thick layer of VLT was placed on the liner during construction. The Phase IV Slot HLP was constructed in 20-foot lifts and covers approximately 86 acres (Ref. 7, p. 12; Ref. 29, pp. 21-22; Ref. 35, p. 21; Ref. 36, p. 32).

Until late 2003, drain-down solution flowed to one of two PLS ponds east of the HLP, where it was pumped to the surface of the HLP for evaporation using mechanical evaporators. Drain-down solution was pumped through an 8-inch-diameter HDPE line to the Plant Feed PLS Pond. Because the northern Phase IV Slot PLS Pond historically leaked, solution was periodically pumped to the southern Phase IV Slot PLS Pond. In 2006, EPA relined the northern Phase IV Slot PLS Pond, and solutions from this pond were routinely conveyed to the 4-Acre Pond constructed by EPA in 2007. In October 2013, use of the 4-Acre Pond was discontinued because it had become filled with mineral salt precipitates, and two new evaporation ponds (Ponds B and C) were constructed and placed into service (Ref. 7, pp. 11, 15, 27). Arimetco ceased adding solution to the HLP in November 1998. The drain-down rate was 2,200 gpm during active operation (Ref. 7, pp. 12, 15; Ref. 29, p. 25; Ref. 35, p. 21; Ref. 36, pp. 32-33). Total drain-down in 2014 was 1,511,224 gallons, with an annual average of 2.9 gpm (Ref. 7, p. 32).

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[5] Monitoring locations for this Source are SPM1, SPM2, and SPM3 (Ref. 20, p. 6).

Materials within the Phase IV Slot HLP include low-grade oxide ore from the Anaconda W-3 Waste Rock dump (low mica quartz monzonite with some oxide alteration on joint faces and replacement minerals, such as chlorite, and trace metal sulfides). VLT oxide tailings (2 to 10 feet thick) were placed on the bottom as drain rock (Ref. 29, p. 25; Ref. 36, p. 33). The volume of materials in the Phase IV Slot HLP is 7,599,000 cubic yards, estimated based on the topography and cross sections of the HLP (Ref. 35, pp. 71, 74, 220, 224).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

2000 START Sampling

From October 19 through October 23, 2000, START, under the direction of EPA, conducted a sampling event at the facility. START collected tailings samples from the former tailings piles to identify the hazardous substances associated with these sources. Sampling was conducted in accordance with protocols described in a SAP approved by EPA. All samples were analyzed by EPA Region 9 Laboratory in Richmond, California for metals by EPA Method 6010. Total uranium and radionuclides were not analyzed. The data were validated by a START Basic Ordering Agreement subcontractor in accordance with EPA-approved procedures (Ref. 4, p. 18).

The tailings sample presented in the table below is representative of Arimetco Phase IV Slot South HLP materials. Sample T-1 was collected from the east side of the Phase IV Slot HLP, immediately north of the Phase IV Slot III PLS Pond (see Figure 6 for location of pond) (Ref. 4, pp. 18-19).

Source 4 Sample Concentrations, mg/kg

Sample ID	Sample Descriptions	Date	Hazardous Substance	Hazardous Substance Concentration	Quantitation Limit	Reference
T-1	Tailings from the Arimetco Phase IV Slot HLP (solid sample).	10/19/2000	Arsenic	10	2	Ref. 4, pp. 19, 51, 72-75, 79
			Chromium	6	2	
			Copper	1,100	4	
			Manganese	50	10	
			Zinc	14	4	

2007 CH2M Hill Sampling

In 2007 CH2MHill, under the direction of EPA, conducted a RI field investigation of the HLPs and their associated ponds. The field program objectives included characterization of HLP materials and drain-down solutions, and collection of sufficient data to evaluate the nature and extent of contamination associated with the HLPs. The work included collection of surface/subsurface samples for geotechnical, geochemical, and radiological analyses. Samples were collected in accordance with a FSP and a QAPP approved by EPA in September 2007 (Ref. 35, p. 29).

Drilling and subsurface sampling of the HLPs were conducted between September 25 and October 17, 2007 by using a sonic drilling rig configured with an 8-inch diameter drill pipe and a 7-inch core. Composite samples were collected at 20-foot intervals; discrete samples were collected at specific depths. Composite sampling for chemical and radiological analysis was conducted by collecting an equal mass of HLP material every 20 feet over the sampling interval.

Four borings were advanced on the Phase IV Slot HLP (Ref. 35, pp. 34-35; Ref. 49, pp. 13-14). Samples were analyzed for metals through the EPA CLP following CLP Statement of Work ILM05.3 and ILM05.4 (Ref. 49, pp. 14-16). Samples were analyzed for isotopic uranium by ASTM D3972-90M (Ref. 49, p. 15-16).

Random surface sampling locations were found to be representative of surface visual and physical conditions of the area being sampled (Ref. 35, p. 36). Prior to surface sample collection, the upper 1 to 2 inches of HLP materials were scraped by using a decontaminated stainless steel trowel to expose a fresh surface (Ref. 35, p. 36). After approximately 3 square feet of “cemented” surface material had been removed to a depth of approximately 3 inches, a disposable trowel was used to collect and homogenize the HLP surface sample (Ref. 35, p. 36). HLP surface samples were collected to a maximum depth of 9 inches below the HLP surface (Ref. 35, p. 36). Four surface samples were collected from the Phase I/II HLP (Ref. 35, p. 37).

Sampling locations are presented in Figure 5 (Ref. 35, p. 42).

Source 4 Sample Concentrations

Sample ID	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H4SSU01 (MY3JW0)	0-50	10/8/2007	Chromium	5.3 J	1	Ref. 35, pp. 166, 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, p. 4, Ref. 54, pp. 8, 15, 41, 51, 53
			Copper	1,180	2.5	
			Lead	3.5	1	
			Manganese	77.6 J	1.5	
			Uranium 234	1.81	0.319	
			Uranium 235	0.0876	0.557	
			Uranium 238	1.68	0.302	
H4SSU02 (MY3LL3)	0-50	10/9/2007	Chromium	6.8 J	1	Ref. 35, pp. 166, 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, pp. 4-5, 9; Ref. 54, pp. 8, 17, 41, 51, 53
			Copper	756	2.5	
			Lead	2.6	1	
			Manganese	54.7	1.5	
			Uranium 234	2	0.351	
			Uranium 235	0.102	0.0683	
			Uranium 238	1.6	0.299	
H4SSU03 (MY3LL9)	50-77	10/9/2007	Chromium	4.4 J	1	Ref. 35, pp. 166, 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, pp. 4-5, 9; Ref. 54, pp. 8, 18, 41, 51, 53
			Copper	856	2.5	
			Lead	3.1	1	
			Manganese	57.7 J	1.5	
			Uranium 234	1.55	0.27	
			Uranium 235	0.0756	0.053	
			Uranium 238	1.51	0.27	

Source 4 Sample Concentrations

Sample ID	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H4SSU04 (MY3LM2)	0-50	10/9/2007	Chromium	4.6 J	1	Ref. 35, pp. 166, 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, pp. 4-5, 9; Ref. 55, pp. 9, 20, 41, 51, 53
			Copper	1,010	2.5	
			Lead	3.9	1	
			Manganese	53.1 J	1.5	
			Uranium 234	1.37	0.264	
			Uranium 238	1.32	0.258	
H4SSS01 (MY3JS8)	Surface	10/24/2007	Arsenic	8.7	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 53, pp. 9, 11, 62, 67, 69
			Chromium	4.6	1	
			Copper	543	2.5	
			Manganese	37	1.5	
			Nickel	6.1	4	
			Zinc	9.3	6	
H4SSS02 (MY3JS9)	Surface	10/23/2007	Arsenic	10.2	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 53, pp. 9, 12, 62, 67, 69
			Chromium	4.9	1	
			Copper	973	2.5	
			Manganese	66.8	1.5	
			Nickel	6.4	4	
			Zinc	13.4	6	
H4SSS03 (MY3JT0)	Surface	10/23/2007	Arsenic	9.1	1	Ref. 35, pp. 166, 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, p. 4; Ref. 53, pp. 9, 13, 62, 67, 69
			Chromium	6.2 J	1	
			Copper	594	2.5	
			Manganese	47.9 J	1.5	
			Nickel	6.8	4	
			Zinc	7.7	6	
H4SSS04 (MY3JT1)	Surface	10/23/2007	Arsenic	15.3 J	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, p. 4; Ref. 53, pp. 9, 14, 62, 67, 69
			Chromium	5.5 J	1	
			Copper	1,030	2.5	
			Manganese	36.4 J	1.5	
			Nickel	6.5 J	4	
			Zinc	7.2	6	
H4SSS05 (MY3JT2)	Surface	10/23/2007	Arsenic	12	1	Ref. 35, pp. 166, 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, p. 4; Ref. 53, pp. 9, 15, 62, 67, 69
			Chromium	2.3 J	1	
			Copper	668	2.5	
			Manganese	38.3 J	1.5	
			Zinc	8.6	6	

Source 4 Sample Concentrations

Sample ID	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H4SSS06 (MY3JT3)	Surface	10/24/2007	Arsenic	31.6	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 53, pp. 9, 16, 62, 67, 69
			Chromium	7.6	1	
			Copper	3,690	2.5	
			Manganese	69.4	1.5	
			Nickel	7.9	4	
			Zinc	22.4	6	
H4SSS07 (MY3JT4)	Surface	10/24/2007	Arsenic	12.8	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, p. 4; Ref. 53, pp. 9, 17, 62, 67, 69
			Chromium	4.2 J	1	
			Copper	1,320	2.5	
			Manganese	57.9 J	1.5	
			Nickel	5.9 J	4	
			Zinc	13.5	6	
H4SSS08 (MY3JT5)	Surface	10/24/2007	Arsenic	17.1	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, p. 4; Ref. 53, pp. 9, 18, 62, 67, 69
			Chromium	2.9 J	1	
			Copper	909	2.5	
			Manganese	49.7 J	1.5	
			Nickel	4.7 J	4	
			Zinc	10.6	6	
H4SSS09 (MY3JT6)	Surface	10/24/2007	Arsenic	13.5	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, p. 4; Ref. 53, pp. 9, 19, 62, 67, 69
			Chromium	6.6	1	
			Copper	614	2.5	
			Manganese	49.4	1.5	
			Nickel	5.3	4	
			Zinc	12.2	6	
H4SSS10 (MY3JT7)	Surface	10/24/2007	Arsenic	22.5	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 53, pp. 9, 20, 62, 67, 69
			Chromium	3.9	1	
			Copper	7,360	2.5	
			Manganese	152	1.5	
			Nickel	8	4	
			Zinc	18.2	6	

J: May be biased high.

*: Depths are reported in feet bgs instead of feet above mean sea level because they are collected within a HLP deposited over the natural ground surface.

CRQL: EPA Contract Laboratory Program Contract Required Quantitation Limit

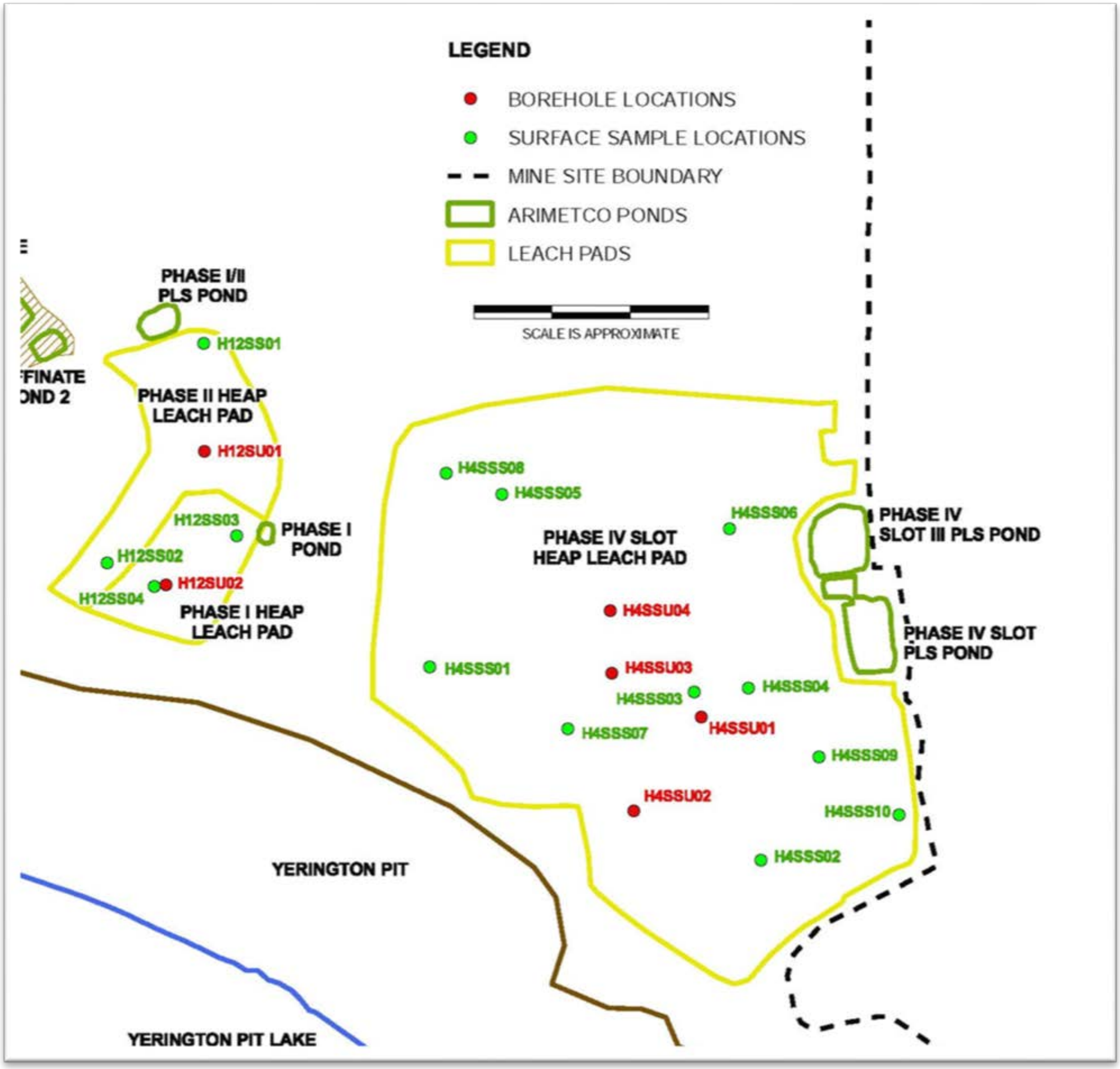


Figure 5: Phase IV Slot HLP 2007 RI Sampling Locations (Ref. 35, pp. 35, 38, 42)

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment Description	Containment Factor Value	Reference
Ground water pathway: Arimetco abandoned operations at the facility in December 1999, leaving 90 million gallons of PLS in the HLP ponds and tailings. A liner with a functioning leachate collection and removal system is present, however, leaks of PLS have been documented. A maintained engineered cover and functioning and maintained run-on control system and runoff management system are not present.	10	Ref. 1, Table 3-2; Ref. 6; Ref. 20, pp. 6*, 9; Ref. 28, p. 3**; Ref. 29, p. 22; Ref. 35, p. 21

*: This reference refers to the Source as “Slot Pad.”

**: Monitoring locations for this Source are SPM1, SPM2, and SPM3 (Ref. 20, p. 6).

2.4.2. Hazardous Waste Quantity

Insufficient information exists to evaluate hazardous constituent quantity and hazardous wastestream quantity. Therefore, the hazardous waste quantity value will be calculated using Tier C, the volume of the tailings pile (Ref. 1, Section 2.4.2.1, pp. 51590, 51591).

2.4.2.1.1 Hazardous Constituent Quantity (Tier A)

The hazardous constituent quantity for Source 4 could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1, pp. 51590-51591). There are insufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 4 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1, p. 51591).

Hazardous Constituent Quantity Value: Not Evaluated

2.4.2.1.2 Hazardous Wastestream Quantity (Tier B)

The hazardous wastestream quantity for Source 4 could not be adequately determined according to the HRS requirements; that is, the mass of the hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2, p. 51591). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of the wastestream plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 4 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, volume (Ref. 1, Section 2.4.2.1.2, p. 51591).

Hazardous Wastestream Quantity Value: Not Evaluated

2.4.2.1.3 Volume (Tier C)

CH2MHill calculated a volume for Source 4 of approximately 7,599,000 cubic yards, based on the topography and cross sections of the HLP (Ref. 35, pp. 71, 74, 220, 224). However, sufficient information to reproduce this calculation was not provided in the reference. The Phase IV Slot HLP covers approximately 86 acres (Ref. 7, p. 12; Ref. 29, p. 22; Ref. 35, pp. 21, 23; Ref. 36, p. 32). The HLP top deck is relatively flat and covers approximately 37 acres in five benches (Ref. 35, pp. 21, 23). However, sufficient information regarding the height of the tailings to calculate the volume for Source 4 with reasonable confidence was not available. Scoring proceeds to the evaluation of Tier D, area (Ref. 1, Section 2.4.2.1.3, p. 51591).

Volume Assigned Value: 0

2.4.2.1.4 Area (Tier D)

The Phase IV Slot HLP covers approximately 86 acres (Ref. 7, p. 12; Ref. 29, p. 22; Ref. 35, pp. 21, 23; Ref. 36, p. 32).

86 acres = 3,746,160 square feet
3,746,160 / 13 = 288,166.2 (Ref. 1, Table 2-5, p. 51591)

Area Assigned Value: 288,166.2

Source Hazardous Waste Quantity Value

According to the Hazard Ranking System (HRS) final rule, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) is assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

Tier Evaluated	Source 4 Values
A	NE
B	NE
C	0
D	288,166.2*

Note:

***** Value selected for the source hazardous waste quantity, according to the HRS.
NE Not Evaluated.

Source Hazardous Waste Quantity Value: 288,166.2

SOURCE 5

Source 5 consists of the Arimetco Phase IV VLT HLP. This source is a tailings pile, constructed between 1995 and 1998 to leach VLT (Ref. 29, p. 22; Ref. 36, p. 19). Hazardous substances associated with this source include arsenic, chromium, copper, lead, manganese, nickel, and zinc. Although uranium is documented in this source, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances (Ref. 4, p. 79; Ref. 35, pp. 163, 169, 172). Containment for Source 5 includes a liner with a functioning leachate collection and removal system documented, though spills of raffinate have been documented (Ref. 20, p. 48; Ref. 29, p. 22, 65; Ref. 35, pp. 21-22).

2.2.1 SOURCE IDENTIFICATION

Name of source: Arimetco Phase IV VLT HLP (OU-8) **Number of source:** 5

Source Type: Tailings Pile

Description and Location of Source (see Figure 1):

The Phase IV VLT HLP was constructed of VLT deposited by Anaconda, and is located near the north end of the former Anaconda Mine property, west of the former Anaconda evaporation ponds (Ref. 36, p. 19). The entire Phase IV VLT HLP and its solution ditches, ponds, and other ancillary features are constructed on private land (Ref. 36, p. 35).

The Phase IV VLT HLP covers an area of approximately 54 acres and was constructed on the southern portion of the Anaconda Finger Ponds (Sources 8 and 9). Arimetco constructed the Phase IV VLT Pad in 20-foot lifts between 1995 and 1998 and included a primary 40-mil HDPE liner and a secondary liner of compacted, naturally-occurring, gray, lean clay. A solution ditch surrounding the Phase IV VLT HLP drains to the northeast corner and is routed through a large sediment control basin to an adjacent PLS Pond (Ref. 7, p. 13; Ref. 29, p. 22; Ref. 35, pp. 21-22; Ref. 36, p. 34).

Materials in the Phase IV VLT HLP include oxide tailings from the crusher and MacArthur Pit run-of-mine and crushed ore (quartz monzonite with replacement minerals, such as chlorite and trace metal sulfides) (Ref. 29, p. 25; Ref. 36, p. 35). The volume of materials in the Phase IV VLT HLP is 6,502,000 cubic yards, estimated based on the topography and cross sections of the HLP (Ref. 35, pp. 71, 74, 220, 225).

Arimetco ceased adding makeup water and acid to the Phase IV VLT HLP in November 1998. Solution drain-down has decreased over time from 3,300 gpm during peak operation. In late 2006, drain-down solutions were diverted to the new 4-acre evaporation pond rather than being pumped back to the top of the Phase IV VLT HLP (Ref. 29, p. 22; Ref. 35, p. 22; Ref. 36, pp. 35-36). Currently, drain-down solutions from the Phase IV VLT HLP flow by gravity to the VLT Pond and, as needed to improve evaporation efficiency, are pumped to one of two new Evaporation Ponds (B and C) constructed in October 2013 (Ref. 7, pp. 13, 15). Total drain-down from January 2014 through December 2014 was 1,812,152 gallons, or an annual average of 3.5 gpm (Ref. 7, p. 31).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

2000 START Sampling

From October 19 through October 23, 2000, START, under the direction of EPA, conducted a sampling event at the facility. START collected tailings samples from the former tailings piles to identify the hazardous substances associated with these sources. Sampling was conducted in accordance with protocols described in a SAP approved by EPA. All samples were analyzed by EPA Region 9 Laboratory in Richmond, California for metals by EPA Method 6010. Total uranium and radionuclides were not analyzed. The data were validated by a START Basic Ordering Agreement subcontractor in accordance with EPA-approved procedures (Ref. 4, p. 18).

The tailings sample presented in the table below is representative of Arimetco Phase IV VLT HLP materials. Sample T-6 was collected from the east side of the Phase IV VLT HLP, immediately south of the Phase IV VLT PLS Pond (see Figure 7 for pond location) (Ref. 4, pp. 18, 20).

Source 5 Sample Concentrations, mg/kg

Sample ID	Sample Descriptions	Date	Hazardous Substance	Hazardous Substance Concentration	Quantitation Limit	References
T-6	Tailings from the Arimetco Phase IV VLT Leach Pad (solid sample).	10/19/2000	Chromium	14	2	Ref. 4, pp. 20, 33, 51, 72-75, 79
			Copper	2,500	2	
			Manganese	220	0.6	
			Nickel	20	10	
			Zinc	22	4	

2007 CH2M Hill Sampling

In 2007 CH2MHill, under the direction of EPA, conducted a RI field investigation of the HLPs and their associated ponds. The field program objectives included characterization of HLP materials and drain-down solutions, and collection of sufficient data to evaluate the nature and extent of contamination associated with the HLPs. The work included collection of surface/subsurface samples for geotechnical, geochemical, and radiological analyses. Samples were collected in accordance with a FSP and a QAPP approved by EPA in September 2007 (Ref. 35, p. 29).

Drilling and subsurface sampling of the HLPs were conducted between September 25 and October 17, 2007 by using a sonic drilling rig configured with an 8-inch diameter drill pipe and a 7-inch core. Composite samples were collected at 20-foot intervals; discrete samples were collected at specific depths. Composite sampling for chemical and radiological analysis was conducted by collecting an equal mass of HLP material every 20 feet over the sampling interval. Three borings were advanced on the Phase IV VLT HLP (Ref. 35, pp. 34, 36; Ref. 49, pp. 13-14). Samples were analyzed for metals through the EPA CLP following CLP Statement of Work ILM05.3 and ILM05.4 (Ref. 49, pp. 14-16). Samples were analyzed for isotopic uranium by ASTM D3972-90M (Ref. 49, p. 15-16).

Random surface sampling locations were found to be representative of surface visual and physical conditions of the area being sampled (Ref. 35, p. 36). Prior to surface sample collection, the upper 1 to 2 inches of HLP materials were scraped by using a decontaminated stainless steel trowel to expose a fresh surface (Ref. 35, p. 36). After approximately 3 square feet of “cemented” surface material had been removed to a depth of approximately 3 inches, a disposable trowel was used to collect and homogenize the HLP surface sample (Ref. 35, p. 36). HLP surface samples were collected to a maximum depth of 9 inches below the HLP surface (Ref. 35, p. 36). Four surface samples were collected from the Phase I/II HLP (Ref. 35, p. 37).

Sampling locations are presented in Figure 6 (Ref. 35, p. 41).

Source 5 Sample Concentrations

Sample ID	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H4VSU01 (MY3LM6)	50-107	9/27/2007	Chromium	4.7	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 57, pp. 8, 12, 25, 34-35
			Copper	702	2.5	
			Lead	2.8	1	
			Manganese	105	1.5	
H4VSU01 (MY3LM5)	0-50	9/27/2007	Chromium	4.8	1	Ref. 35, pp. 166, 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 57, pp. 8, 11, 25, 34-35
			Copper	579	2.5	
			Lead	2.2	1	
			Manganese	63.9	1.5	
			Uranium 234	1.97	0.371	
			Uranium 235	0.132	0.087	
			Uranium 238	1.63	0.324	
H4VSU02 (MY3LM7)	0-50	10/2/2007	Chromium	4.9	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, pp. 4-5, 9; Ref. 54, pp. 9, 21, 41, 51, 53
			Copper	1,020	2.5	
			Lead	3.8	1	
			Manganese	71.9	1.5	
H4VSU02 (MY3LM8)	50-107	10/5/2007	Chromium	9	1	Ref. 35, pp. 166, 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, pp. 4-5, 10; Ref. 54, pp. 9, 22, 41, 51, 53
			Copper	906	2.5	
			Manganese	74.9	1.5	
			Uranium 234	2.22	0.382	
			Uranium 235	0.0651	0.0567	
			Uranium 238	1.77	0.323	
H4VSU03 (MY3LM9)	0-50	10/6/2007	Chromium	4.1	1	Ref. 35, pp. 166, 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, pp. 4-5, 10; Ref. 54, pp. 9, 23, 41, 51, 53
			Copper	686	2.5	
			Lead	2.9	1	
			Manganese	75.9	1.5	
			Uranium 234	1.68	0.308	
			Uranium 235	0.132	0.0752	
			Uranium 238	1.49	0.283	

Source 5 Sample Concentrations

Sample ID	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H4VSU03 (MY3LM9)	50-87	10/6/2007	Chromium	9.7	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 54, pp. 9, 24, 41, 51, 53
			Copper	681	2.5	
			Lead	2.1 J	1	
			Manganese	83.8	1.5	
H4VSS01 (MY3JT8)	surface	10/26/2007	Arsenic	9.4	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 53, pp. 10, 21, 61, 67, 69
			Chromium	5.1	1	
			Copper	10,400	2.5	
			Lead	5.5 J	1	
			Manganese	336	1.5	
			Nickel	31.4	4	
			Zinc	62.5	6	
H4VSS02 (MY3JT9)	surface	10/26/2007	Arsenic	8.3	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 53, pp. 10, 22, 61, 67, 69
			Chromium	10.3	1	
			Copper	1,230	2.5	
			Manganese	96.9	1.5	
			Nickel	10.7	4	
			Zinc	23.6	6	
H4VSS03 (MY3JW0)	surface	10/26/2007	Arsenic	6	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 53, pp. 10, 23, 61, 67, 69
			Chromium	4.4	1	
			Copper	643	2.5	
			Manganese	86.3	1.5	
			Nickel	7.2	4	
			Zinc	11.2	6	
H4VSS04 (MY3JW1)	surface	10/26/2007	Arsenic	11.5	1	Ref. 35, pp. 166, 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 52, pp. 4-5, 9; Ref. 53, pp. 10, 24, 61, 67, 69
			Chromium	9.5	1	
			Copper	1,620	2.5	
			Manganese	181	1.5	
			Nickel	12.5	4	
			Zinc	20.8	6	
H4VSS05 (MY3JW2)	surface	10/26/2007	Arsenic	13.9	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 53, pp. 10, 25, 61, 67, 69
			Chromium	4.5	1	
			Copper	824	2.5	
			Manganese	52	1.5	
			Nickel	5.7	4	
			Zinc	15.9	6	

Source 5 Sample Concentrations

Sample ID	Sample Depth (feet bgs*)	Date	Hazardous Substance	Hazardous Substance Concentration	Metals CRQL /Radionuclides ± 2σ uncertainty	References
HLP Material (metals, mg/kg; radionuclides, pCi/g)						
H4VSS06 (MY3LL3)	surface	10/24/2007	Arsenic	8.7	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 53, pp. 10, 26, 61, 67, 69
			Chromium	3.7	1	
			Copper	703	2.5	
			Manganese	58.4	1.5	
			Nickel	6.2	4	
			Zinc	10.8	6	
H4VSS07 (MY3LL4)	surface	10/26/2007	Arsenic	9.1	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 53, pp. 10, 27, 61, 67, 69
			Chromium	5.6	1	
			Copper	896	2.5	
			Manganese	153	1.5	
			Nickel	12.3	4	
			Zinc	26.2	6	
H4VSS08 (MY3LL5)	surface	10/26/2007	Arsenic	7.8	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 53, pp. 10, 28, 61, 67, 69
			Chromium	6.4	1	
			Copper	2,840	2.5	
			Manganese	155	1.5	
			Nickel	12.7	4	
			Zinc	14	6	
H4VSS09 (MY3LL6)	surface	10/26/2007	Arsenic	8.1	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 53, pp. 10, 29, 61, 67, 69
			Chromium	2.8	1	
			Copper	559	2.5	
			Manganese	69.1	1.5	
			Nickel	5.8	4	
			Zinc	16.8	6	
H4VSS10 (MY3LL7)	surface	10/26/2007	Arsenic	13.6	1	Ref. 35, pp. 169, 172; Ref. 49, pp. 14-15, 67, 69; Ref. 53, pp. 10, 30, 61, 67, 69
			Chromium	24.2	1	
			Copper	6,920	2.5	
			Manganese	825	1.5	
			Nickel	41.2	4	
			Zinc	72.6	6	

*: Depths are reported in feet bgs instead of feet above mean sea level because they are collected within a HLP deposited over the natural ground surface.

J - Estimated result (Ref. 49, p. 71)

CRQL: EPA Contract Laboratory Program Contract Required Quantitation Limit

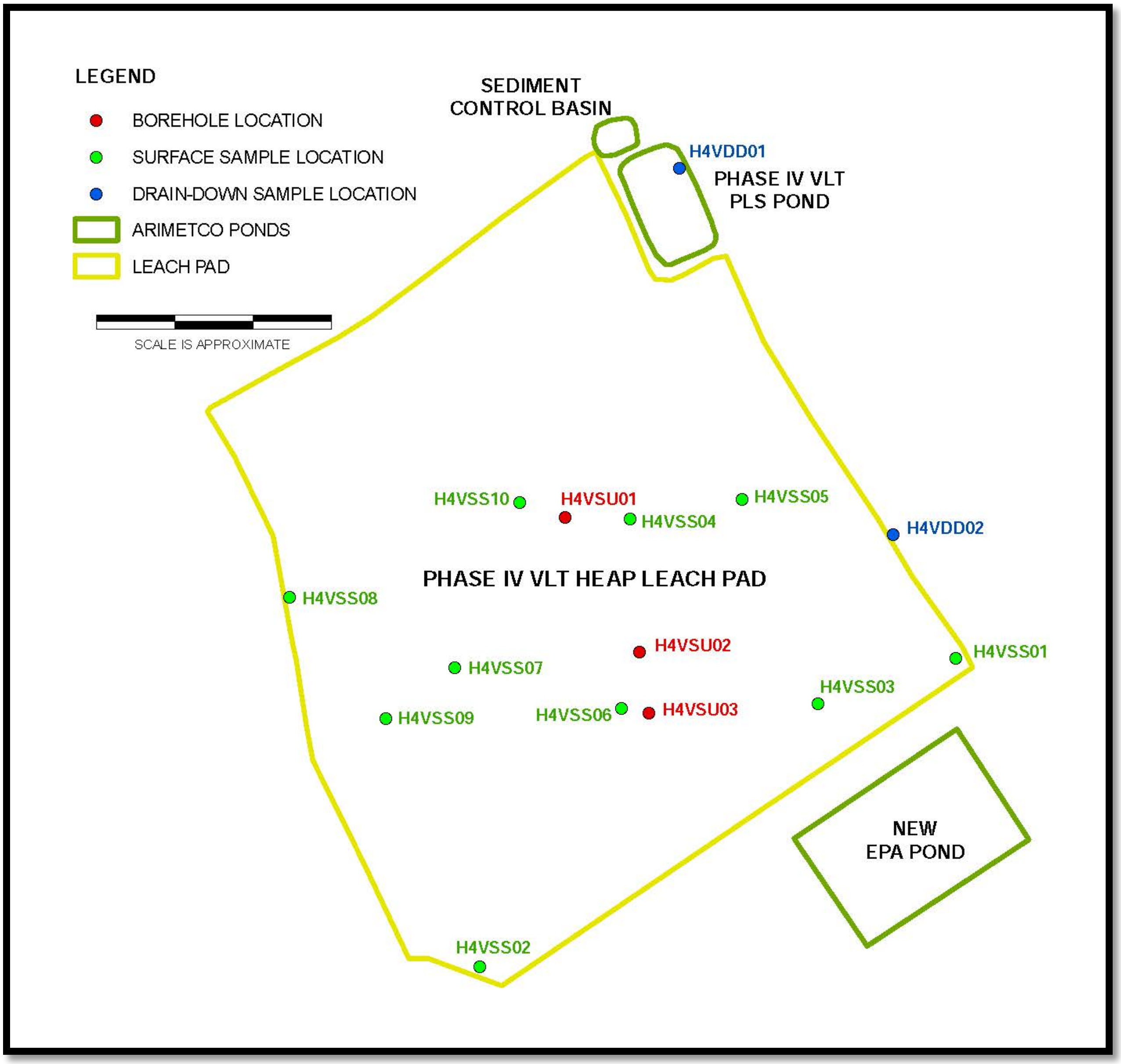


Figure 6: Phase IV VLT HLP 2007 RI Sampling Locations (Ref. 35, pp. 36, 39, 41)

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment Description	Containment Factor Value	References
Ground Water Pathway: Arimetco abandoned operations at the facility in December 1999, leaving 90 million gallons of PLS in the HLP ponds and tailings. A liner with a functioning leachate collection and removal system is present, however, spills of raffinate have been documented. A maintained engineered cover and functioning and maintained run-on control system and runoff management system are not present.	10	Ref. 1, Table 3-2; Ref. 6; Ref. 20, p. 48; Ref. 29, pp. 22, 65; Ref. 35, pp. 21-22

2.4.2. Hazardous Waste Quantity

Insufficient information exists to evaluate hazardous constituent quantity and hazardous wastestream quantity. Therefore, the hazardous waste quantity value will be calculated using Tier C, the volume of the tailings pile (Ref. 1, Section 2.4.2.1, pp. 51590, 51591).

2.4.2.1.1 Hazardous Constituent Quantity (Tier A)

The hazardous constituent quantity for Source 5 could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1, pp. 51590-51591). There are insufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 5 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1, p. 51591).

Hazardous Constituent Quantity Value: Not Evaluated

2.4.2.1.2 Hazardous Wastestream Quantity (Tier B)

The hazardous wastestream quantity for Source 5 could not be adequately determined according to the HRS requirements; that is, the mass of the hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2, p. 51591). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of the wastestream plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 5 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, volume (Ref. 1, Section 2.4.2.1.2, p. 51591).

Hazardous Wastestream Quantity Value: Not Evaluated

2.4.2.1.3 Volume (Tier C)

CH2MHill calculated a volume for Source 5 of approximately 6,502,000 cubic yards, based on the topography and cross sections of the HLP (Ref. 35, pp. 71, 74, 220, 225). However, sufficient information to reproduce this calculation was not provided in the reference. The Phase IV VLT HLP covers an area of approximately 54 acres (Ref. 7, p. 13; Ref. 29, p. 22; Ref. 35, pp. 21, 23; Ref. 36, p. 34). A generally flat surface of approximately 29 acres exists at the top of the HLP in two benches (Ref. 35, pp. 21, 23; Ref. 36, p. 35). However, sufficient information regarding the height of the tailings to calculate the volume for Source 5 with reasonable confidence was not available. Scoring proceeds to the evaluation of Tier D, area (Ref. 1, Section 2.4.2.1.3, p. 51591).

Volume Assigned Value: 0

2.4.2.1.4 Area (Tier D)

The Phase IV VLT HLP covers an area of approximately 54 acres (Ref. 7, p. 13; Ref. 29, p. 22; Ref. 35, pp. 21, 23; Ref. 36, p. 34).

54 acres = 2,352,240 square feet
2,352,240 / 13 = 180,941.5

Area Assigned Value: 180,941.5

Source Hazardous Waste Quantity Value

According to the HRS, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) is assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

Tier Evaluated	Source 5 Values
A	NE
B	NE
C	0
D	180,941.5*

Note:

***** Value selected for the source hazardous waste quantity, according to the HRS.
NE Not Evaluated.

Source Hazardous Waste Quantity Value: 180,941.5

SOURCE 6

Source 6 consists of the Lined Evaporation Pond (LEP). This source is a waste pile remaining in an evaporation pond used to store and evaporate excess process solutions from the oxide ore beneficiation processes from approximately 1974 through 1978 (Ref. 24, p. 6; Ref. 39, pp. 25, 50). Hazardous substances associated with this source include arsenic, chromium, copper, lead, manganese, nickel, and zinc. Although uranium is documented in this source, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances (Ref. 4, p. 80; Ref. 39, pp. 64-65, 67-68). Containment for Source 6 includes an asphalt liner without a functioning leachate collection and removal system. The asphalt liner has deteriorated, and liquids are able to move into the underlying soils (Ref. 39, pp. 25-26, 49-50).

2.2.1 SOURCE IDENTIFICATION

Name of source: Lined Evaporation Pond (OU-4) **Number of source:** 6

Source Type: Waste Pile

Description and Location of Source (see Figure 1):

During Anaconda operations, discarded solutions from the vat-leaching operations were conveyed by open ditch and disposed of by evaporation in the northern portion of the facility. This area was developed into multiple evaporation ponds that cover an area of approximately 500 acres. These ponds are evaluated as Sources 6 through 9. In 1955, the flow rate to the drainage area averaged approximately 2,000,000 gallons per day, or 1,385 gpm (Ref. 29, p. 50).

No specific information has been found describing the chemical makeup or pH of the waste water disposed in these ponds, although it is known to have originated from the oxide leaching plant. The leaching and cementation process used large quantities of sulfuric acid, much of which was consumed by the ore and scrap iron. The discharged process solutions likely contained elevated concentrations of acid-soluble metals, including copper. Metals and other constituents precipitated as sulfate salts as the water evaporated (Ref. 39, p. 24).

One of these ponds was the Lined Evaporation Pond (LEP) used to store and evaporate excess process solutions from the oxide ore beneficiation processes from approximately 1974 through 1978. The pond includes three sub-sections (North, Middle and South), which were lined with a thin asphalt liner over an 8 to 18-inch base of VLT. The asphalt liner appears to have been a mixture of hot asphalt tar mixed with crushed gravel, similar to road paving, and is approximately 0.5 to 1 inch thick. The LEP appears to have been constructed as one single lined surface which was subsequently subdivided into the three sections by construction of two graveled roads across the pond liner (Ref. 24, p. 6; Ref. 39, pp. 25, 49).

The asphalt liner has deteriorated in areas where it has been exposed and shows signs of cracking, peeling and erosion. In an area of seasonal standing water, the VLT base material and underlying soils were locally observed to be close to saturation. This condition indicated that meteoric water was able to move through the LEP sediments and liner materials into the underlying soils (Ref. 24, p. 7; Ref. 39, pp. 25-26, 49-50).

The LEP is mostly located on BLM property, with a small portion on the west side located on private property. The LEP, excluding the Weed Heights sewage lagoons, has a total combined area of approximately 101 acres (Ref 24, p. 6). The thickness of the pond sediments averages 3 to 6 inches, with a maximum measured thickness of approximately 12 inches in select areas within the central topographically lower portion of the LEP (Ref. 24, p. 7; Ref. 39, p. 25). The volume of pond sediments contained in the LEP is approximately 65,800 cubic yards (Ref. 24, p. 6).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

2000 START Sampling

From October 19 through October 23, 2000, START, under the direction of EPA, conducted a sampling event at the facility. START collected tailings samples from the former tailings piles to identify the hazardous substances associated with these sources. Sampling was conducted in accordance with protocols described in a SAP approved by EPA. All samples were analyzed by EPA Region 9 Laboratory in Richmond, California for metals by EPA Method 6010. Total uranium and radionuclides were not analyzed. The data were validated by a START Basic Ordering Agreement subcontractor in accordance with EPA-approved procedures (Ref. 4, p. 18).

The tailings sample presented in the table below is representative of LEP materials. Sample T-9 was collected from the west central portion of the LEP, immediately west of sampling location OU4-LEP-64-SED see Figure 8 for location of this sample) (Ref. 4, pp. 18, 20).

Source 6 Sample Concentrations, mg/kg

Sample ID	Sample Descriptions	Date	Hazardous Substance	Hazardous Substance Concentration	Quantitation Limit	References
T-9	Tailings from the LEP	10/19/2000	Chromium	13	2	Ref. 4, pp. 20, 51, 80, 84
			Copper	2,200	2	
			Manganese	900	4	
			Nickel	50	0.6	
			Zinc	140	4	

2008 Brown and Caldwell Sampling

On behalf of ARC, Brown and Caldwell implemented a Removal Action Characterization of the evaporation ponds in October 2008. This was a pre-removal sampling, and no known removal of materials from this source has been conducted (Ref. 39, pp. 17, 112-118). Sampling, analyses, and data validation were conducted in accordance with procedures in a Work Plan approved by EPA in September 2008 (Ref. 39, p. 17). Boreholes were drilled within the LEP to collect shallow and deep samples for geochemical analysis (Ref. 39, pp. 28-30). In addition to samples of LEP pond sediments and soils, samples of VLT were collected from below the liner (Ref. 39, p. 41). Samples were analyzed for metals via EPA Methods 6010B, 6020, and 7471A (Ref. 39, p. 33). Sample locations are shown in Figure 7. Maximum metals concentrations in each matrix are presented below.

Source 6 LEP Maximum Sample Concentrations by Matrix, mg/kg

Sample Matrix	Sample Depth (feet bgs*)	Hazardous Substance	Hazardous Substance Maximum Concentration (Sample ID)	Quantitation Limit	References
LEP VLT	0.5 to 2	Arsenic	4.6 (OU4-LEP-29B-SC)	2.6	Ref. 39, pp. 64, 67, 580, 583, 589, 592, 654-655, 915, 4019-4020
	0.5 to 3	Copper	440 (OU4-LEP-32B-SC)	5.3	
	0.5 to 3	Lead	3.6 (OU4-LEP-32B-SC)	2.6	
	0.5 to 2.5	Manganese	79 (OU4-LEP-30B-SC)	1.1	
	0.5 to 2.5	Uranium	3.99 (OU4-LEP-30B-SC)	0.8	
LEP Pond Sediments	0 to 0.25	Chromium	15 (OU4-LEP-23A-SC)	7.0	Ref. 39, pp. 64, 67, 518, 566, 618, 620, 622, 658, 951, 4019-4020
	0 to 1	Copper	2,800 (OU4-LEP-19A-SC)	6.2	
	0 to 0.33	Lead	5.1 (OU4-LEP-27A-SC)	4.0	
	0 to 0.25	Manganese	1,100 (OU4-LEP-23A-SC)	5.6	
	0 to 0.25	Nickel	57 (OU4-LEP-23A-SC)	7.0	
	0 to 0.25	Uranium	60.5 (OU4-LEP-23A-SC)	0.8	
LEP Soils	1 to 3	Chromium	31 (OU4-LEP-20B-SC)	6.3	Ref. 39, pp. 65, 68, 396, 407, 519, 566, 584, 621, 625, 654, 658-659, 1059, 4019
	1.7 to 3	Copper	1,000 (OU4-LEP-19B-SC)	12	
	3 to 7	Lead	12 (OU4-LEP-05A-SC)	0.61	
	2.5 to 6	Manganese	1,900 (OU4-LEP-30C-SC)	2.5	
	1 to 3	Nickel	32 (OU4-LEP-20B-SC)	6.3	
	1.5 to 3	Uranium	46.6 (OU4-LEP-24B-SC)	0.8	

*: Sample depths are reported in feet bgs rather than feet above mean sea level because the elevations of the sampling locations are not known.

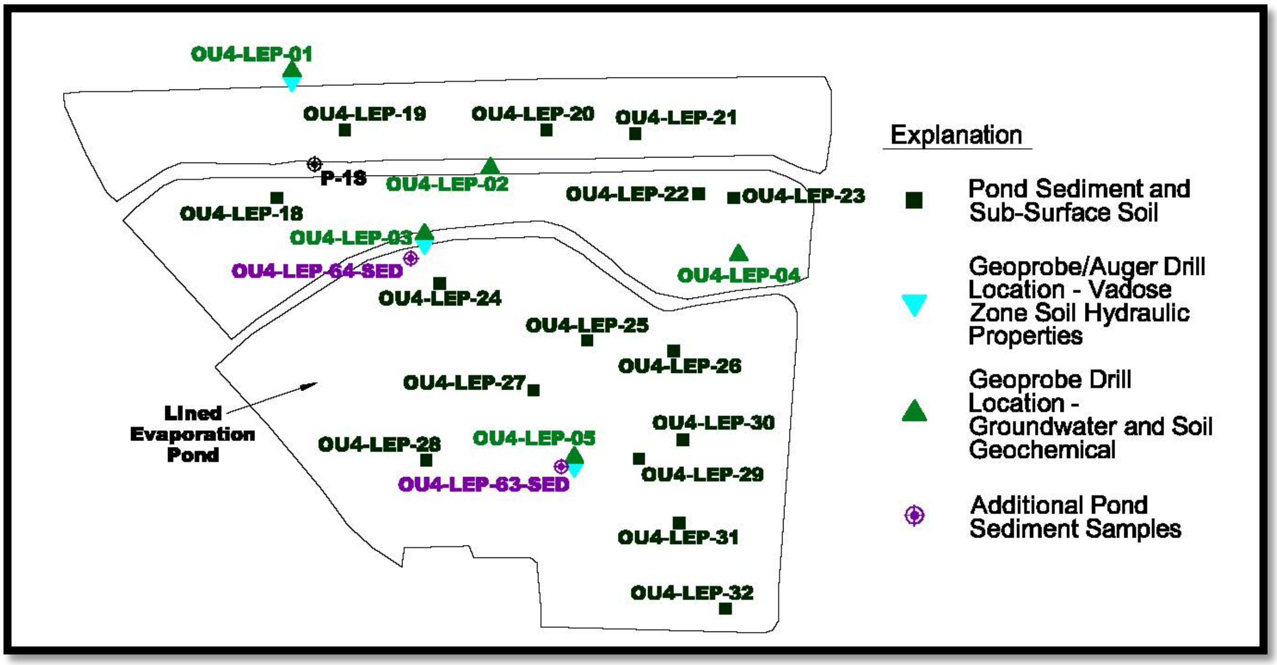


Figure 7: LEP 2008 Sampling Locations (Ref. 39, pp. 136, 260-269)

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment Description	Containment Factor Value	References
Ground Water Pathway: The LEP has an asphalt liner over VLT. However, the asphalt liner has deteriorated in areas where it has been exposed and shows signs of cracking, peeling and erosion. In the area of seasonal standing water in the LEP, the VLT base material and underlying soils were locally observed to be close to saturation. This condition indicated that meteoric water was able to move through the LEP sediments and liner materials into the underlying soils. A maintained engineered cover, functioning and maintained run-on control system and runoff management system, or functioning leachate collection and removal system immediately above the liner have not been observed.	10	Ref. 1, Table 3-2; Ref. 24, p. 6-7; Ref. 39, pp. 25-26, 49-50

2.4.2. Hazardous Waste Quantity

Insufficient information exists to evaluate hazardous constituent quantity and hazardous wastestream quantity. Therefore, the hazardous waste quantity value will be calculated using Tier C, the volume of the waste pile (Ref. 1, Section 2.4.2.1, pp. 51590, 51591).

2.4.2.1.1 Hazardous Constituent Quantity (Tier A)

The hazardous constituent quantity for Source 6 could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1, pp. 51590-51591). There are insufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 6 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1, p. 51591).

Hazardous Constituent Quantity Value: Not Evaluated

2.4.2.1.2 Hazardous Wastestream Quantity (Tier B)

The hazardous wastestream quantity for Source 6 could not be adequately determined according to the HRS requirements; that is, the mass of the hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2, p. 51591). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of the wastestream plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 6 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, volume (Ref. 1, Section 2.4.2.1.2, p. 51591).

Hazardous Wastestream Quantity Value: Not Evaluated

2.4.2.1.3 Volume (Tier C)

The volume of the LEP was calculated by Brown & Caldwell to be approximately 65,800 cubic yards (Ref. 24, p. 6; Ref. 39, p. 25). However, the volume calculations were not presented to verify this result. The LEP, excluding the Weed Heights sewage lagoons, has a total combined area of approximately 101 acres (Ref 24, p. 6). The thickness of the pond sediments averages 3 to 6 inches, with a maximum measured thickness of approximately 12 inches in select areas within the central topographically lower portion of the LEP (Ref. 24, p. 7; Ref. 39, p. 25). Using an average thickness of 4.5 inches:

101 acres = 488,836.2 square yards
4.5 inches = 0.125 yards
488,836.2 square yards X 0.125 yards = 61,104.5 cubic yards
61,104.5 / 2.5 = 24,441.8 (Ref. 1, Table 2-5)

Volume Assigned Value: 24,441.8

2.4.2.1.4 Area (Tier D)

Because the volume of Source 6 is determined, Tier D, area is not evaluated.

Area Assigned Value: 0

Source Hazardous Waste Quantity Value

According to the HRS, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) is assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

Tier Evaluated	Source 6 Values
A	NE
B	NE
C	24,441.8*
D	0

Note:

* Value selected for the source hazardous waste quantity, according to the HRS.
NE Not Evaluated.

Source Hazardous Waste Quantity Value: 24,441.8

SOURCE 7

Source 7 consists of the Unlined Evaporation Pond (UEP). This source is a waste pile remaining in an evaporation pond used for evaporation of spent process solutions from the copper oxide (vat) leaching operation from approximately 1954 through 1978 (Ref. 24, p. 7; Ref. 39, pp. 23, 51). Hazardous substances associated with this source include arsenic, chromium, copper, lead, manganese, nickel, and zinc. Although uranium is documented in this source, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances (Ref. 4, p. 79; Ref. 39, pp. 64-65, 67-68). The UEP is unlined, and there is no evidence of a leak detection system (Ref. 39, p. 23).

2.2.1 SOURCE IDENTIFICATION

Name of source: Unlined Evaporation Pond (UEP) (OU-4) **Number of source:** 7

Source Type: Waste Pile

Description and Location of Source (see Figure 1):

During Anaconda operations, discarded solutions from the vat-leaching operations were conveyed by open ditch and disposed of by evaporation in the northern portion of the facility. This area was developed into multiple evaporation ponds that cover an area of approximately 500 acres. These ponds are evaluated as Sources 6 through 9. In 1955, the flow rate to the drainage area averaged approximately 2,000,000 gallons per day, or 1,385 gpm (Ref. 29, p. 50).

No specific information has been found describing the chemical makeup or pH of the waste water disposed in these ponds, although it is known to have originated from the oxide leaching plant. The leaching and cementation process used large quantities of sulfuric acid, much of which was consumed by the ore and scrap iron. The discharged process solutions likely contained elevated concentrations of acid-soluble metals, including copper. Metals and other constituents precipitated as sulfate salts as the water evaporated (Ref. 39, p. 24).

The UEP consists of a large northern section (98 acres) and a much smaller southern section (4.1 acres), with about half of the northern section and all of the southern section located on BLM property. Initially, from approximately 1954 to 1961, the entire area of the Sulfide Tailings (Source 10) and the UEP were used as one large area for the evaporation of spent process solutions discharged from the copper oxide (vat) leaching operation. In 1961, the area was reduced to its current size and continued to operate in the same capacity until operations ended in 1978. The estimated volume of pond sediments contained in the UEP is approximately 270,230 cubic yards based on an average thickness measured during 2008 sampling activities of approximately 1.5 feet in the large northern section and about five feet in the small southern section (Ref. 24, p. 7; Ref. 39, pp. 23, 51).

The UEP was constructed on alluvial soils without a liner, and is surrounded by berms constructed of VLT, which generally consist of half to three-quarter inch size fractions with finer grained sand, silt, and clay-size materials. The pond bottom was not excavated into the alluvial fan slope and, therefore, becomes deeper toward the northeast with the general slope of the underlying terrain (Ref. 24, p. 7; Ref. 39, p. 23).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

2000 START Sampling

From October 19 through October 23, 2000, START, under the direction of EPA, conducted a sampling event at the facility. START collected tailings samples from the former tailings piles to identify the hazardous substances associated with these sources. Sampling was conducted in accordance with protocols described in a SAP approved by EPA. All samples were analyzed by EPA Region 9 Laboratory in Richmond, California for metals by EPA Method 6010. Total uranium and radionuclides were not analyzed. The data were validated by a START Basic Ordering Agreement subcontractor in accordance with EPA-approved procedures (Ref. 4, p. 18).

The tailings sample presented in the table below is representative of UEP materials. Sample T-7 was collected from the west central portion of the UEP, near sampling location OU4-UEP-42 (see Figure 9 for location of this sample) (Ref. 4, pp. 18, 20).

Source 7 Sample Concentrations, mg/kg

Sample ID	Sample Descriptions	Date	Hazardous Substance	Hazardous Substance Concentration	Quantitation Limit	References
T-7	Tailings from the Unlined Evaporation Pond	10/19/2000	Cadmium	3	1	Ref. 4, pp. 20, 51, 72-74, 76, 79, 84
			Chromium	13	2	
			Copper	680	4	
			Manganese	230	10	
			Nickel	14	10	
			Zinc	56	4	

2008 Brown and Caldwell Sampling

On behalf of ARC, Brown and Caldwell implemented a Removal Action Characterization of the evaporation ponds in October 2008. This was a pre-removal sampling, and no removal of materials from this source has been conducted. Sampling, analyses, and data validation were conducted in accordance with procedures in a Work Plan approved by EPA in September 2008 (Ref. 39, p. 17). Boreholes were drilled within the UEP to collect shallow and deep samples for geochemical analysis (Ref. 39, pp. 28-31). Samples were analyzed for metals via EPA Methods 6010B, 6020, and 7471A (Ref. 39, p. 33). Sample locations are shown in Figure 8. Maximum metals concentrations in UEP pond sediments and soils are presented below.

Source 7 UEP Maximum Sample Concentrations by Matrix, mg/kg

Sample Matrix	Sample Depth (feet bgs*)	Hazardous Substance	Hazardous Substance Maximum Concentration (Sample ID)	Reporting Limit	References
UEP Pond Sediments	0 to 2	Arsenic	75** (OU4-UEP-34A-SC)	3.9	Ref. 39, pp. 64, 67, 520, 534, 543, 546, 567-570, 594, 655, 817, 4018-4019
	0 to 0.5	Chromium	8.7** (OU4-UEP-33A-SC)	7.8	
	0 to 2	Copper	950** (OU4-UEP-34A - SC)	6.5	
	0.33 to 2.5	Lead	170 (OU4-UEP-42B-SC)	3.1	
	0 to 2	Manganese	540 (OU4-UEP-34A-SC)	11	
	0 to 2	Nickel	9.1** (OU4-UEP-33A-SC)	6.3	
	0.5 to 2	Uranium	104 (OU4-UEP-41B-SC)	0.8	
UEP Soils	2 to 3	Arsenic	37** (OU4-UEP-34B-SC)	0.62	Ref. 39, pp. 66, 69, 490, 502, 529, 535, 538, 547, 568-570, 595, 655, 817, 4018-4019
	4 to 7	Chromium	24** (OU4-UEP-09A-SC)	6.8	
	1.5 to 3	Copper	380** (OU4-UEP-37B-SC)	6.8	
	1.5 to 3	Lead	16 (OU4-UEP-46B-SC)	0.61	
	17 to 20	Manganese	320** (OU4-UEP-07B-SC)	2.4	
	15.5 to 20	Nickel	15** (OU4-UEP-06A-SC)	6.0	
	2 to 3	Uranium	80.1 (OU4-UEP-41C-SC)	0.8	
	2 to 3	Zinc	770 (OU4-UEP-34B-SC)	56	

*: Sample depths are reported in feet bgs rather than feet above mean sea level because the elevations of the sampling locations are not known.

**: Maximum concentration using unqualified data only.

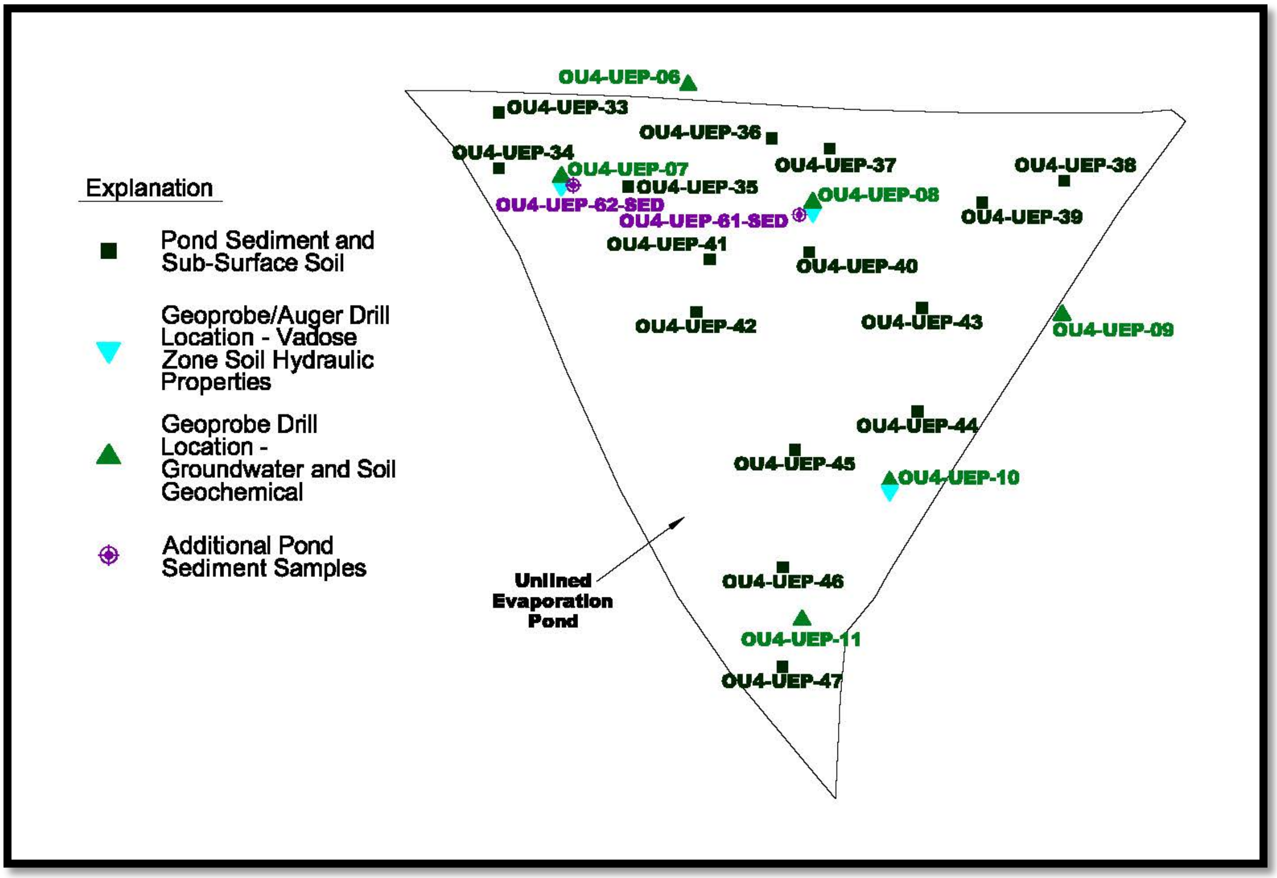


Figure 8: UEP 2008 Sampling Locations (Ref. 39, pp. 136, 270-280)

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment Description	Containment Factor Value	References
Ground Water Pathway: The UEP is unlined. A maintained engineered cover, functioning and maintained run-on control system and runoff management system, or functioning leachate collection and removal system immediately above the liner have not been observed.	10	Ref. 1, Table 3-2; Ref. 24, p. 7; Ref. 39, p. 23

2.4.2. Hazardous Waste Quantity

Insufficient information exists to evaluate hazardous constituent quantity and hazardous wastestream quantity. Therefore, the hazardous waste quantity value will be calculated using Tier C, the volume of the pile (Ref. 1, Section 2.4.2.1, pp. 51590, 51591).

2.4.2.1.1 Hazardous Constituent Quantity (Tier A)

The hazardous constituent quantity for Source 7 could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1, pp. 51590-51591). There are insufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 7 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1, p. 51591).

Hazardous Constituent Quantity Value: Not Evaluated

2.4.2.1.2 Hazardous Wastestream Quantity (Tier B)

The hazardous wastestream quantity for Source 7 could not be adequately determined according to the HRS requirements; that is, the mass of the hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2, p. 51591). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of the wastestream plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 7 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, volume (Ref. 1, Section 2.4.2.1.2, p. 51591).

Hazardous Wastestream Quantity Value: Not Evaluated

2.4.2.1.3 Volume (Tier C)

The UEP consists of a large northern section (98 acres) and a much smaller southern section (4.1 acres). Based on an average thickness of 1.5 feet in the northern section and 5 feet in the southern section, Brown & Caldwell estimated that the UEP contains approximately 270,230 cubic yards of material (Ref. 24, p. 7; Ref. 39, p. 23).

Northern Section: 98 acres = 474,316.3 square yards; 1.5 feet = 0.5 yard
474,316.3 square yards X 0.5 yard = 237,158.15 cubic yards

Southern Section: 4.1 acres = 19,843.85 square yards; 5 feet = 1.67 yards
19,843.85 square yards X 1.67 yards = 33,073.08 cubic yards

(237,158.15 + 33,073.08) / 2.5 = 108,092.5 (Ref. 1, Table 2-5)

Volume Assigned Value: 108,092.5

2.4.2.1.4 Area (Tier D)

Because the volume of Source 7 is determined, Tier D, area is not evaluated.

Area Assigned Value: 0

Source Hazardous Waste Quantity Value

According to the HRS, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) is assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

Tier Evaluated	Source 7 Values
A	NE
B	NE
C	108,092.5*
D	0

Note:

* Value selected for the source hazardous waste quantity, according to the HRS.
NE Not Evaluated.

Source Hazardous Waste Quantity Value: 108,092

SOURCE 8

Source 8 consists of the Finger Evaporation Ponds (FEPs) 1-4. This source includes four waste piles remaining in evaporation ponds that were used for evaporation of spent process solutions from the copper oxide (vat) leaching operation beginning in 1978. FEPs 1-4 are aggregated as a single source because they are adjacent, were built concurrently with identical construction methods, and received the same process solutions (Ref. 39, pp. 26-28). Hazardous substances associated with this source include arsenic, chromium, copper, lead, manganese, nickel, and zinc. Although uranium is documented in this source, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances (Ref. 39, pp. 65-66, 68-69). The FEPs 1-4 have a deteriorated asphalt liner, and there is no evidence of a leak detection system (Ref. 39, p. 27).

2.2.1 SOURCE IDENTIFICATION

<u>Name</u> of source: Finger Evaporation Ponds (FEPs) 1-4 (OU-4) **<u>Number</u> of source:** 8

<u>Source Type</u>: Waste Pile

<u>Description</u> and <u>Location</u> of Source (see Figure 1):

During Anaconda operations, discarded solutions from the vat-leaching operations were conveyed by open ditch and disposed of by evaporation in the northern portion of the facility. This area was developed into multiple evaporation ponds that cover an area of approximately 500 acres. These ponds are evaluated as Sources 6 through 9. In 1955, the flow rate to the drainage area averaged approximately 2,000,000 gallons per day, or 1,385 gpm (Ref. 29, p. 50).

No specific information has been found describing the chemical makeup or pH of the waste water disposed in these ponds, although it is known to have originated from the oxide leaching plant. The leaching and cementation process used large quantities of sulfuric acid, much of which was consumed by the ore and scrap iron. The discharged process solutions likely contained elevated concentrations of acid-soluble metals, including copper. Metals and other constituents precipitated as sulfate salts as the water evaporated (Ref. 39, p. 24).

Just west of the UEP (Source 7), there are five additional unlined ponds referred to as the FEPs 1 through 5 or A through E (Ref. 29, p. 50). FEP 5, or the Thumb Pond, is evaluated as Source 9. FEPs 1-4 were constructed by Anaconda in approximately 1974, at about the same time as the LEP. The specific source of process solutions placed in the four FEPs was not documented (Ref. 39, p. 26-27). However, the same solutions from the oxide leaching process that were conveyed to the UEP were also likely conveyed to FEPs 1-4, based on the similarity in appearance of the pond sediments (Ref. 39, p. 27).

FEPs 1-4 were constructed with a minimal cut and fill technique to create a flat bottom, which was subsequently lined with asphalt similar in construction and characteristics to the LEP asphalt liner. However, these ponds do not appear to have any VLT as a base for the liner, as the liner appears to lie directly on the underlying soils (Ref. 39, p. 27). Each of these four ponds was originally 2,500 to 3,000 feet long and approximately 100 to 200 feet wide. The southern half of these ponds was covered by the Arimetco Phase IV VLT Heap Leach Pad (Source 5) in 1995.

The surface area of these ponds is approximately 17.8 acres and the estimated volume of materials contained within the ponds is 5,838 cubic yards based on an average observed thickness of four inches. These ponds are located on private property. The asphalt liner is significantly deteriorated due to exposure to sun and weather (Ref. 39, pp. 27).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

2008 Brown and Caldwell Sampling

On behalf of ARC, Brown and Caldwell implemented a Removal Action Characterization of the evaporation ponds in October 2008. No known removal of materials from this source has been conducted. Sampling, analyses, and data validation were conducted in accordance with procedures in a Work Plan approved by EPA in September 2008 (Ref. 39, p. 17). Boreholes were drilled within FEPs 1-4 to collect shallow and deep samples for geochemical analysis (Ref. 39, pp. 28-31). Samples were analyzed for metals via EPA Methods 6010B, 6020, and 7471A (Ref. 39, p. 33). Sample locations are shown in Figure 9. Maximum metals concentrations in FEP 1-4 pond sediments and soils are presented below.

Source 8 FEP 1-4 Maximum Sample Concentrations by Matrix, mg/kg

Sample Matrix	Sample Depth (feet bgs*)	Hazardous Substance	Hazardous Substance Maximum Concentration (Sample ID)	Reporting Limit	References
FEP 1-4 Pond Sediments	0 to 0.25	Arsenic	7.4 (OU4-FEP-58A-SC)	2.6	Ref. 39, pp. 65, 68, 598, 600, 610, 656-657, 950, 4019-4020
	0 to 0.5	Chromium	12 (OU4-FEP-59A-SC)	5.3	
	0 to 0.5	Copper	640 (OU4-FEP-59A-SC)	5.3	
	0 to 0.5	Lead	17 (OU4-FEP-55A-SC)	3.0	
	0 to 0.5	Manganese	980 (OU4-FEP-59A-SC)	2.1	
	0 to 0.5	Nickel	29 (OU4-FEP-59A-SC)	5.3	
	0 to 0.25	Uranium	9.44 (OU4-FEP-56A-SC)	0.8	
	0 to 0.5	Zinc	100 (OU4-FEP-59A-SC)	53	
FEP 1-4 Soils	2 to 3.5	Arsenic	14 (OU4-FEP-14A-SC)	2.9	Ref. 39, pp. 66, 69, 601, 613, 656-657, 661-662, 666, 668, 678-680, 1030, 4018-4020
	6.5 to 66.5	Chromium	56 (OU4-FEP-16B-SC)	5.3	
	1 to 3	Copper	70 (OU4-FEP-59B-SC)	5.6	
	0.25 to 1	Lead	11 (OU4-FEP-56B-SC)	2.8	
	6.5 to 66.5	Manganese	420 (OU4-FEP-16B-SC)	11	
	6.5 to 66.5	Nickel	12 (OU4-FEP-16B-SC)	5.3	
	2 to 3.5	Uranium	11.5 (OU4-FEP-15A-SC)	0.8	
	1 to 3	Zinc	58 (OU4-FEP-15A-SC)	56	

*: Sample depths are reported in feet bgs rather than feet above mean sea level because the elevations of the sampling locations are not known.

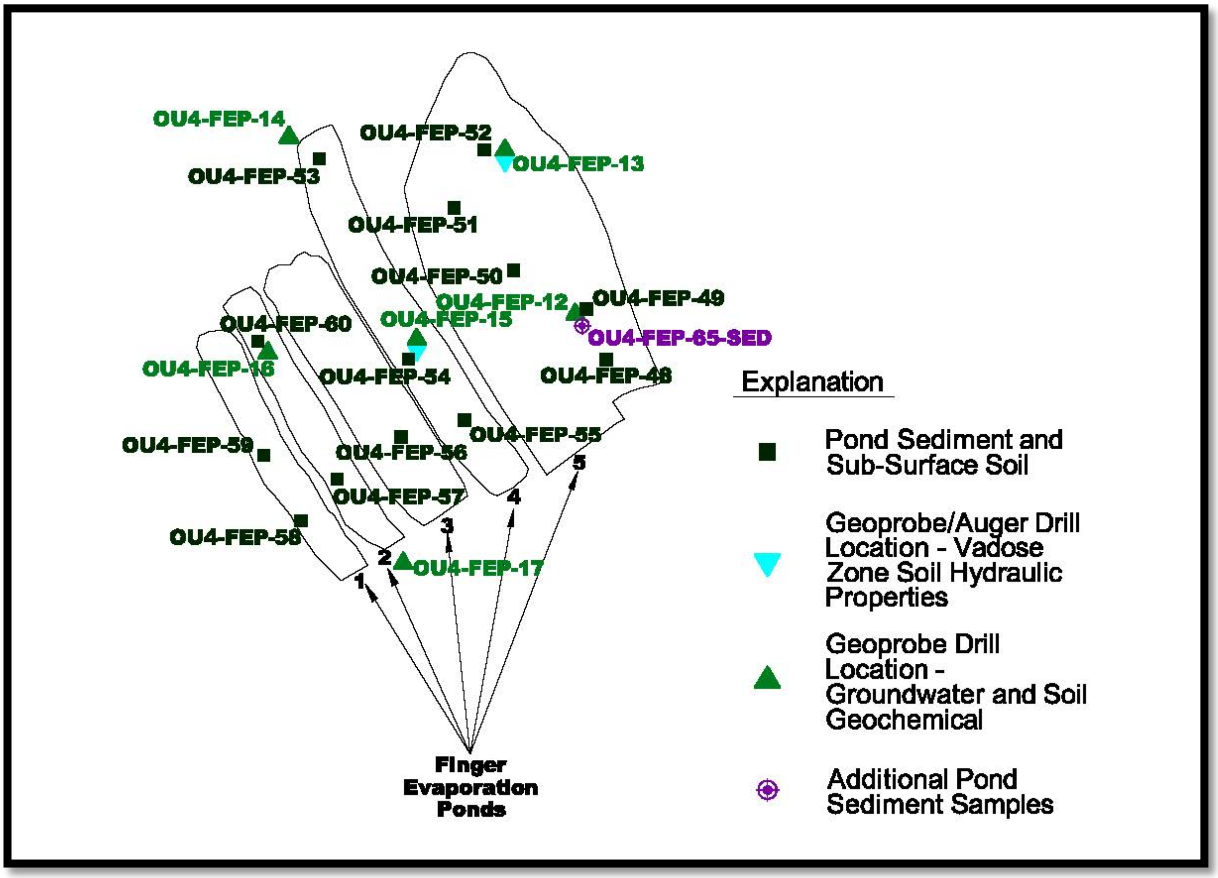


Figure 9: FEPs 1-4 and Thumb Pond 2008 Sampling Locations (Ref. 39, pp. 136; 282-297)

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment Description	Containment Factor Value	References
Ground Water Pathway: The FEPs 1-4 have an asphalt liner constructed directly on native soils. The current condition of the asphalt liner is significantly deteriorated due to exposure to sun and weather. A maintained engineered cover, functioning and maintained run-on control system and runoff management system, or functioning leachate collection and removal system immediately above the liner have not been observed.	10	Ref. 1, Table 3-2; Ref. 39, p. 27

2.4.2. Hazardous Waste Quantity

Insufficient information exists to evaluate hazardous constituent quantity and hazardous wastestream quantity. Therefore, the hazardous waste quantity value will be calculated using Tier C, the volume of the pile (Ref. 1, Section 2.4.2.1, pp. 51590, 51591).

2.4.2.1.1 Hazardous Constituent Quantity (Tier A)

The hazardous constituent quantity for Source 8 could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1, pp. 51590-51591). There are insufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 8 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1, p. 51591).

Hazardous Constituent Quantity Value: Not Evaluated

2.4.2.1.2 Hazardous Wastestream Quantity (Tier B)

The hazardous wastestream quantity for Source 8 could not be adequately determined according to the HRS requirements; that is, the mass of the hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2, p. 51591). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of the wastestream plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 8 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, volume (Ref. 1, Section 2.4.2.1.2, p. 51591).

Hazardous Wastestream Quantity Value: Not Evaluated

2.4.2.1.3 Volume (Tier C)

The surface area of the FEPs 1-4 is approximately 17.8 acres. The average observed thickness is approximately four inches (Ref. 39, pp. 26, 27). Therefore:

17.8 acres = 86,151.3 square yards; 4 inches = 0.11 yard
86,151.3 square yards X 0.11 yard = 9,476.6 cubic yards
9,476.6 / 2.5 = 3,790.6 (Ref. 1, Table 2-5)

Volume Assigned Value: 3,790.6

2.4.2.1.4 Area (Tier D)

Because the volume of Source 8 is determined, Tier D, area is not evaluated.

Area Assigned Value: 0

Source Hazardous Waste Quantity Value

According to the HRS, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) is assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

Tier Evaluated	Source 8 Values
A	NE
B	NE
C	3,790.6*
D	0

Note:

* Value selected for the source hazardous waste quantity, according to the HRS.
NE Not Evaluated.

Source Hazardous Waste Quantity Value: 3,790.6

SOURCE 9

Source 9 consists of the Thumb Pond (FEP 5). This source is a waste pile in an evaporation pond used from approximately 1955 to 1977 to contain the red calcine tails and other dust precipitates created during the roasting of sulfur ore in the production of sulfuric acid at the Acid Plant (Ref. 39, p. 27). Hazardous substances associated with this source include arsenic, cadmium, chromium, copper, lead, manganese, nickel, and zinc. Although uranium is documented in this source, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances (Ref. 39, pp. 65-66, 68-69). The Thumb Pond is unlined, and has been capped with approximately 8 to 12 inches of VLT (Ref. 39, p. 28).

2.2.1 SOURCE IDENTIFICATION

Name of source: Thumb Pond (FEP 5) (OU-4) **Number of source:** 9

Source Type: Pile

Description and Location of Source (see Figure 1):

During Anaconda operations, discarded solutions from the vat-leaching operations were conveyed by open ditch and disposed of by evaporation in the northern portion of the facility. This area was developed into multiple evaporation ponds that cover an area of approximately 500 acres. These ponds are evaluated as Sources 6 through 9. In 1955, the flow rate to the drainage area averaged approximately 2,000,000 gallons per day, or 1,385 gpm (Ref. 29, p. 50).

No specific information has been found describing the chemical makeup or pH of the waste water disposed in these ponds, although it is known to have originated from the oxide leaching plant. The leaching and cementation process used large quantities of sulfuric acid, much of which was consumed by the ore and scrap iron. The discharged process solutions likely contained elevated concentrations of acid-soluble metals, including copper. Metals and other constituents precipitated as sulfate salts as the water evaporated (Ref. 39, p. 24).

Just west of the UEP (Source 7), there are five additional unlined ponds referred to as the FEPs 1 through 5 or A through E (Ref. 29, p. 50). FEP 5, or the Thumb Pond, is the largest and oldest of the Finger Ponds. It was used from approximately 1955 to 1977 to contain the red calcine tails and other dust precipitates created during the roasting of sulfur ore in the production of sulfuric acid at the Acid Plant. Waste water discharged to this pond was likely acidic and also likely to be elevated in various metals. The red-colored sediments in this pond were observed to consist of homogeneous, very fine-grained silt. The thickness of sediment encountered in this pond was highly variable, from 1 inch thick to a maximum thickness of 11.5 feet, with an estimated average thickness of approximately 3.5 feet (Ref. 24, p. 8; Ref. 39, p. 27).

The unlined Thumb Pond has elevated embankments along the north and east sides, but no apparent cut on the uphill side. The pond was approximately 4,500 feet long by 600 to 1,000 feet wide as originally constructed, but the southern two-thirds was also covered by the Arimetco Phase IV VLT HLP (Source 5) and adjacent VLT fill. The exposed portion of this pond covers about 69 acres and has been capped with VLT materials. An average thickness of 3.5 feet of sediment was observed, not including the VLP cap. Brown & Caldwell estimated 95,000 cubic yards of materials within this pond, including only the remaining exposed portion and not including VLT capping material; however, this calculation could not be verified based on the provided information (Ref. 24, p. 8; Ref. 39, p. 28).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

2008 Brown and Caldwell Sampling

On behalf of ARC, Brown and Caldwell implemented a Removal Action Characterization of the evaporation ponds in October 2008. This was a pre-removal sampling, and no removal of materials from this source has been conducted. Sampling, analyses, and data validation were conducted in accordance with procedures in a Work Plan approved by EPA in September 2008 (Ref. 39, p. 17). Boreholes were drilled within the Thumb Pond to collect shallow and deep samples for geochemical analysis (Ref. 39, pp. 28-31). Samples were analyzed for metals via EPA Methods 6010B, 6020, and 7471A (Ref. 39, p. 33). Sample locations are shown in Figure 9. Maximum metals concentrations in Thumb Pond sediments and soils are presented below.

Source 9 Thumb Pond Maximum Sample Concentrations by Matrix, mg/kg

Sample Matrix	Sample Depth (feet bgs*)	Hazardous Substance	Hazardous Substance Maximum Concentration (Sample ID)	Reporting Limit	References
Thumb Pond Sediments	9 to 12	Arsenic	1,400 (OU4-FEP-48C-SC)	8.1	Ref. 39, pp. 65, 68, 433, 436-437, 440, 457-460, 733, 4018-4020
	0.5 to 4	Cadmium	2.7 (OU4-FEP-52B-SC)	0.94	
	9 to 12	Chromium	180 (OU4-FEP-48C-SC)	1.6	
	0.5 to 2	Copper	570 (OU4-FEP-50B-SC)	1.7	
	0.5 to 2	Lead	1,100 (OU4-FEP-50B-SC)	8.4	
	0.5 to 4	Nickel	170 (OU4-FEP-49B-SC)	2.5	
	0.5 to 4	Uranium	404 (OU4-FEP-52B-SC)	0.8	
	0.5 to 4	Zinc	690 (OU4-FEP-52B-SC)	190	
Thumb Pond Soils	2 to 5	Arsenic	200 (OU4-FEP-50C-SC)	0.52	Ref. 39, pp. 66, 69, 434, 465-466, 478, 784, 4018-4020
	11 to 15	Chromium	26 (OU4-FEP-12A-SC)	1.1	
	12 to 15	Copper	44** (OU4-FEP-48D-SC)	1.1	
	40 to 43	Lead	8.4 (OU4-FEP-13B-SC)	0.57	
	1 to 5	Manganese	50** (OU4-FEP-51B-SC)	1.1	
	40 to 43	Nickel	5.7 (OU4-FEP-13B-SC)	1.1	
	40 to 43	Uranium	89.4 (OU4-FEP-13B-SC)	0.8	
	40 to 43	Zinc	34 (OU4-FEP-13B-SC)	11	

*: Sample depths are reported in feet bgs rather than feet above mean sea level because the elevations of the sampling locations are not known.

**: Maximum concentration using unqualified data only.

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment Description	Containment Factor Value	References
Ground Water Pathway: The Thumb Pond is unlined, and has been capped with approximately 8 to 12 inches of VLT. A functioning and maintained run-on control system and runoff management system, or functioning leachate collection and removal system immediately above the liner have not been observed.	10	Ref. 1, Table 3-2; Ref. 24, p. 8; Ref. 39, p. 27-28

2.4.2. Hazardous Waste Quantity

Insufficient information exists to evaluate hazardous constituent quantity and hazardous wastestream quantity. Therefore, the hazardous waste quantity value will be calculated using Tier C, the volume of the pile (Ref. 1, Section 2.4.2.1, pp. 51590, 51591).

2.4.2.1.1 Hazardous Constituent Quantity (Tier A)

The hazardous constituent quantity for Source 9 could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1, pp. 51590-51591). There are insufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 9 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1, p. 51591).

Hazardous Constituent Quantity Value: Not Evaluated

2.4.2.1.2 Hazardous Wastestream Quantity (Tier B)

The hazardous wastestream quantity for Source 9 could not be adequately determined according to the HRS requirements; that is, the mass of the hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2, p. 51591). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of the wastestream plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 9 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, volume (Ref. 1, Section 2.4.2.1.2, p. 51591).

Hazardous Wastestream Quantity Value: Not Evaluated

2.4.2.1.3 Volume (Tier C)

The portion of this pond not covered by the Phase IV VLT HLP (Source 5) measures approximately 69 acres. The average observed thickness, not including the VLT capping material, is 3.5 feet (Ref. 24, p. 8; Ref. 39, p. 28). Therefore:

69 acres = 333,957.4 square yards; 3.5 feet = 1.17 yards
333,957.4 square yards * 1.17 yards = 390,730.2
390,730.2 / 2.5 = 156,292.1 (Ref. 1, Table 2-5)

Volume Assigned Value: 156,292.1

2.4.2.1.4 Area (Tier D)

Because the volume of Source 9 is determined, Tier D, area is not evaluated.

Area Assigned Value: 0

Source Hazardous Waste Quantity Value

According to the HRS, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) is assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

Tier Evaluated	Source 9 Values
A	NE
B	NE
C	156,292.1*
D	0

Note:

* Value selected for the source hazardous waste quantity, according to the HRS.
NE Not Evaluated.

Source Hazardous Waste Quantity Value: 156,292.1

SOURCE 10

Source 10 consists of the Sulfide Tailings Area. This source is a tailings pile remaining in an evaporation pond, used from 1961 through 1978 to deposit the sulfide ore tailings slurry within an area contained by a dam constructed of VLT (Ref. 24, p. 8; Ref. 29, p. 52). Hazardous substances associated with this source include chromium, copper, lead, manganese, nickel, and zinc (Ref. 4, pp. 20, 51, 80). The Sulfide Tailings Area is unlined, and has been capped with VLT (Ref. 29, pp. 52-53).

2.2.1 SOURCE IDENTIFICATION

Name of source: Sulfide Tailings Area (OU-4) **Number of source:** 10

Source Type: Tailings Pile

Description and Location of Source (see Figure 1):

The Sulfide Tailings Area is the depositional area for the dewatered slurry from the sulfide ore benefaction process that operated between January 1961 and June 1978. The sulfide ore process involved recovering the copper by fine crushing and chemical flotation. Tailings were deposited as a slurry in designated pond areas, from which decanted water was pumped back to the process circuit via water recycling ponds located on the southern margin of the Sulfide Tailings Area. In 1964, the mine was disposing of nearly 6,900 tons of material a day and using nearly 1.5 million gallons of water in the disposal process (Ref. 24, p. 8; Ref. 29, p. 52).

The depositional area for the sulfide ore tailings slurry was contained by a dam that was constructed of VLT material beginning in 1958. The dam was constructed to accommodate an estimated 21 million tons of sulfide ore. The tailings line was carried on the top of the dam, and discharge pipes were placed at regular intervals at the north face of the dam, allowing tailings to discharge in that area. By discharging the tailings here, the fines were expected to seal off the face of the dam and the ground surface, and eventually prevent seepage (Ref. 29, p. 52).

The sulfide tailings comprise rock that was ground to less than 65 mesh and deposited over an area of approximately 600 acres. When the sulfide tailings were dry and exposed to wind, they generated an extreme dust hazard. To address this dust hazard, Anaconda covered the sulfide tailings with VLT. When Anaconda operations ceased in 1978, approximately 95 percent of the surface of the sulfide tailings was covered with VLT. The remaining 5 percent was considered too unstable to cover at the time of closure because of the grain size and moisture content. In 2006, EPA covered most of the remaining exposed sulfide tailings with VLT to address dust concerns (Ref. 29, pp. 11, 53).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

2000 START Sampling

From October 19 through October 23, 2000, START, under the direction of EPA, conducted a sampling event at the facility. START collected tailings samples from the former tailings piles to identify the hazardous substances associated with these sources. Sampling was conducted in accordance with protocols described in a SAP approved by EPA. All samples were analyzed by EPA Region 9 Laboratory in Richmond, California for metals by EPA Method 6010. Total uranium and radionuclides were not analyzed. The data were validated by a START Basic Ordering Agreement subcontractor in accordance with EPA-approved procedures (Ref. 4, p. 18).

The sample presented in the table below is representative of the Sulfide Tailings Area materials. Sample T-10 was collected from the northwest corner of the Sulfide Tailings Area (Ref. 4, pp. 18, 20, 51).

Source 10 Sample Concentrations, mg/kg

Sample ID	Sample Descriptions	Date	Hazardous Substance	Hazardous Substance Concentration	Quantitation Limit	References
T-10	Solids from the Sulfide Tailings Impoundment	10/19/2000	Chromium	17	2	Ref. 4, pp. 20, 48, 51, 72-74, 76, 80
			Copper	2,300	4	
			Manganese	170	10	
			Nickel	20	10	
			Zinc	30	4	

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment Description	Containment Factor Value	References
Ground Water Pathway: There is no evidence for a liner in the Sulfide Tailings Area. As of 2006, the exposed surface has been covered with VLT. A functioning and maintained run-on control system and runoff management system, or a functioning leachate collection and removal system have not been observed.	10	Ref. 1, Table 3-2; Ref. 29, pp. 52-53

2.4.2. Hazardous Waste Quantity

Insufficient information exists to evaluate hazardous constituent quantity. Therefore, the hazardous waste quantity value will be calculated using Tier B, the hazardous wastestream quantity of the pile (Ref. 1, Section 2.4.2.1, pp. 51590, 51591).

2.4.2.1.1 Hazardous Constituent Quantity (Tier A)

The hazardous constituent quantity for Source 10 could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1, pp. 51590-51591). There are insufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 10 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1, p. 51591).

Hazardous Constituent Quantity Value: Not Evaluated

2.4.2.1.2 Hazardous Wastestream Quantity (Tier B)

The hazardous wastestream quantity for Source 10 could not be adequately determined according to the HRS requirements; that is, the mass of the hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2, p. 51591). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of the wastestream plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 10 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, volume (Ref. 1, Section 2.4.2.1.2, p. 51591).

Hazardous Wastestream Quantity Value: Not Evaluated

2.4.2.1.3 Volume (Tier C)

The Sulfide Tailings Area was constructed to contain an estimated 21 million tons of material (Ref. 29, p. 52). In accordance with Ref. 1, Table 2-5:

21,000,000 tons = 21,000,000 cubic yards
21,000,000 / 2.5 = 8,400,000

Volume Assigned Value: 8,400,000

2.4.2.1.4 Area (Tier D)

Because the hazardous wastestream quantity of Source 10 is determined, Tier D, area is not evaluated.

Area Assigned Value: 0

Source Hazardous Waste Quantity Value

According to the HRS, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) is assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

Tier Evaluated	Source 10 Values
A	NE
B	NE
C	8,400,000*
D	0

Note:

* Value selected for the source hazardous waste quantity, according to the HRS.
NE Not Evaluated.

Source Hazardous Waste Quantity Value: 8,400,000

SOURCE 11

Source 11 consists of the Oxide Tailings Area. This source is a tailings pile, used beginning in 1953 to deposit oxide tailings from Anaconda's vat leach process (Ref. 24, p. 9; Ref. 29, pp. 55-56). Hazardous substances associated with this source include chromium, copper, lead, manganese, nickel, and zinc (Ref. 12, pp. 573-574). Although uranium is documented in this source, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances. There is no evidence for a liner in the Oxide Tailings Area (Ref. 29, pp. 55-56).

2.2.1 SOURCE IDENTIFICATION

Name of source: Oxide Tailings Area (OU-6) **Number of source:** 11

Source Type: Tailings Pile

Description and Location of Source (see Figure 1):

The oxide tailings or VLT are the leached products of Anaconda's vat leach copper extraction process. The oxide tailings dumps, located north of the Process Areas, contain the crushed rock and the red sludge at the base of the leach vats that remained following the extraction of copper in the vat-leaching process. The vat-leach process involved crushing ore into a uniform minus 0.5-inch size, and loading it into one of eight large concrete leach vats where weak sulfuric acid was circulated over an 8-day period. Pregnant leach water exiting the vats was conveyed to the precipitation vats, where cement copper was precipitated onto iron and de-tinned cans. Barren water was then passed to iron launders, where excess iron was removed and the water recycled to the leach vats. Following the 8-day cycle, the spent ore was removed from the vats and transferred to haul trucks for conveyance to the oxide tailings area. The rate of delivery of oxide tailings was estimated at about 10,000 tons per day, beginning in 1953. The sulfate- and iron-rich water that resulted from this process was discharged to the unlined and lined evaporation ponds (Sources 6 through 9) (Ref. 24, p. 9; Ref. 29, pp. 55-56).

The oxide tailings area covers approximately 500 acres, with an average height exceeding 100 feet. The top surfaces are composed of multiple benches and VLT mounds and have been channeled to prevent storm runoff and erosion. In planning for the Phase IV VLT HLP project, Arimetco estimated that nearly 70 million tons of material remained in the oxide tailings area. The VLT material is characterized as a homogeneous quartz monzonite (Ref. 24, p. 9; Ref. 29, p. 56; Ref. 37, p. 25).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

2010 Brown and Caldwell Sampling

VLT characterization field activities were implemented as described in a June 18, 2010 Work Plan, in accordance with the updated Site-wide Quality Assurance Project Plan approved by EPA. Hand auger soil samples were collected between May 11 and 13, 2010. Twenty sampling locations were situated in the north borrow area, and four locations were situated in the south borrow area (Ref. 12, pp. 5-6). The north borrow area is located at the northern end of the Oxide Tailings Area adjacent to the Phase IV VLT HLP (Source 5). The south borrow area is located at the southern end of the Oxide Tailings Area adjacent to the Phase III 4X HLP (Source 3) (see Figure 1) (Ref. 12, p. 21). At each location, samples were generally collected from 0.5-1.0 foot bgs and from 2.5-3.0 feet bgs. A total of 49 primary VLT samples were collected for characterization (Ref. 12, p. 6). Samples were analyzed for total metals by EPA Methods 6010B, 6020, and 7471A (Ref. 12, p. 8). Maximum concentrations from each area are presented below.

Source 11 Maximum Sample Concentrations, mg/kg

Sampling Locations	Sample Depth (feet bgs*)	Hazardous Substance	Maximum Hazardous Substance Concentration (Sample ID)	Quantitation Limit	References
North Borrow Area	1.8 to 2.3	Arsenic	10 (VLT-XRF-15C)	2.5	Ref. 12, pp. 22, 41-48, 63-83, 140, 156, 170, 189, 200, 206-207, 214-215, 233-234, 236-237, 358, 573-574
	2.5 to 3	Chromium	38 (VLT-XRF-12B)	5.0	
	0.5 to 1	Copper	1,800 (VLT-XRF-DUP7)	5.1	
	1.8 to 2.3	Lead	5.7 (VLT-XRF-15C)	2.5	
	2.5 to 3	Manganese	71 (VLT-XRF-19B)	2.5	
	2.5 to 3	Nickel	15 (VLT-XRF-15B)	5.0	
	2.5 to 3	Uranium	232 (VLT-XRF-5B)	0.1	
	2.5 to 3	Zinc	67 (VLT-XRF-5B)	49	
South Borrow Area	0.5 to 1	Arsenic	17 (VLT-XRF-24A)	2.5	Ref. 12, pp. 23, 48, 84-87, 126-133, 154-155, 158, 246, 574
	0.5 to 1	Chromium	40 (VLT-XRF-23A)	5.0	
	2.5 to 3	Copper	1,600 (VLT-XRF-23B)	4.9	
	0.5 to 1	Lead	3.6 (VLT-XRF-21A)	2.5	
	0.5 to 1	Manganese	75 (VLT-XRF-23A)	2.5	
	0.5 to 1	Nickel	25 (VLT-XRF-23A)	5.0	
	0.5 to 1	Uranium	3.74 (VLT-XRF-23A	0.1	
	0.5 to 1	Zinc	1,800 (VLT-XRF-23A)	5.0	

*: Sample depths are reported in feet bgs rather than feet above mean sea level because the elevations of the sampling locations are not known.

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment Description	Containment Factor Value	Reference
Ground Water Pathway: A liner, functioning and maintained run-on control system and runoff management system, or a functioning leachate collection and removal system have not been observed.	10	Ref. 1, Table 3-2; Ref. 24. p. 9; Ref. 37, pp. 86-103

2.4.2. Hazardous Waste Quantity

Insufficient information exists to evaluate hazardous constituent quantity. Therefore, the hazardous waste quantity value will be calculated using Tier B, the hazardous wastestream quantity of the pile (Ref. 1, Section 2.4.2.1, pp. 51590, 51591).

2.4.2.1.1 Hazardous Constituent Quantity (Tier A)

The hazardous constituent quantity for Source 11 could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1, pp. 51590-51591). There are insufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 11 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1, p. 51591).

Hazardous Constituent Quantity Value: Not Evaluated

Tier B: Hazardous Wastestream Quantity

In 2003, Arimetco estimated that approximately 70 million tons of tailings were present in the Oxide Tailings Area (Ref. 29, p. 56). However, data to support these calculations was not provided. Therefore, the hazardous wastestream quantity for Source 11 could not be adequately determined according to the HRS requirements; that is, the mass of the hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2, p. 51591). There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of the wastestream plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 10 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, volume (Ref. 1, Section 2.4.2.1.2, p. 51591).

Hazardous Wastestream Quantity Value: Not Evaluated

2.4.2.1.3 Volume (Tier C)

The oxide tailings area covers approximately 500 acres, with an average height exceeding 100 feet (Ref. 24, p. 9; Ref. 29, p. 56).

500 acres = 2,419,981 square yards; 100 feet = 33.3 yards
2,419,981 square yards * 33.3 yards = 80,585,367 cubic yards
80,585,367 / 2.5 = 32,234,146.8

Volume Assigned Value: 32,234,146.8

2.4.2.1.4 Area (Tier D)

Because the hazardous wastestream quantity of Source 11 is determined, Tier D, area is not evaluated.

Area Assigned Value: 0

Source Hazardous Waste Quantity Value

According to the HRS, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) is assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

Tier Evaluated	Source 11 Values
A	NE
B	NE
C	32,234,146.8*
D	0

Note:

* Value selected for the source hazardous waste quantity, according to the HRS.
NE Not Evaluated**.**

Source Hazardous Waste Quantity Value: 32,234,146.8

SITE SUMMARY OF SOURCE DESCRIPTIONS

Source No.	Source Hazardous Waste Quantity Value (see Section 2.4.2 for Sources 1 through 11)	Containment			
		Ground Water	Surface Water	Gas	Air Particulate
1	46,910.8	10	NE	NE	NE
2	154,135.4	9	NE	NE	NE
3	167,538.5	10	NE	NE	NE
4	288,166.2	10	NE	NE	NE
5	180,941.5	10	NE	NE	NE
6	24,441.8	10	NE	NE	NE
7	108,092.5	10	NE	NE	NE
8	3,790.6	10	NE	NE	NE
9	156,292.1	10	NE	NE	NE
10	8,400,000	10	NE	NE	NE
11	32,234,146.8	10	NE	NE	NE
TOTAL	41,764,456.2				

Notes:

NE = Not Evaluated.

OTHER POSSIBLE SOURCES NOT SCORED

Arimetco Fluid Management System

PLS within the Arimetco HLPs (Sources 1 through 5) is maintained by a fluid management system that includes series of solution ditches and ponds (Ref. 7, pp. 11-15). The total capacity of these ponds is approximately 10.8 million gallons (Ref. 7, p. 15). Hazardous substances in PLS collected from these ponds include arsenic, cadmium, chromium, copper, lead, manganese, nickel, uranium, and zinc (Ref. 35, pp. 156-158). Multiple spills and leaks have been documented from the fluid management system (Ref. 20, pp. 2-4, 6, 8-20; Ref. 28, pp. 3-4; Ref. 29, pp. 60-71; Ref. 36, pp. 38-40; Ref. 44, p. 23). Ponds associated with the Arimetco fluid management system are not scored, because they do not affect the listing decision.

Arimetco Plant Area

The Arimetco Plant consists of an SX/EW building on the north side, concrete SX Tanks, offices, laboratory, and a maintenance shop. Two HDPE-lined Raffinate Ponds are located east of these structures (Ref. 36, p. 37). Arimetco continued processing solutions through the Plant until its abandonment of the mine facility in January 2000 (Ref. 36, p. 37). Spills and leaks have been documented from these ponds (Ref. 20, p. 17; Ref. 28, p. 3; Ref. 36, p. 39). Hazardous substances in PLS from the Raffinate #2 Pond include cadmium, chromium, copper, lead, manganese, nickel, and zinc (Ref. 4, pp. 19, 51, 62). Hazardous substances in soils in the Arimetco Plant Area include arsenic, cadmium, chromium, copper, lead, manganese, nickel, and zinc (Ref. 14, pp. 139-145). The Arimetco Plant Area is not scored because it contains multiple source types, and because it does not affect the listing decision.

Anaconda Process Area

The Anaconda Process Area, which covers an area of approximately 230 acres, consists of the central processing facilities used by Anaconda (Ref. 22, p. 5). The Anaconda Process Area included various buildings, primary and secondary crushers, an acid plant, leach vats, a precipitation plant, sulfide plant, fuel filling stations, acid tanks, storage area, conveyance piping and ditches, and discharge ponds and dry wells (Ref. 29, p. 38). Hazardous substances in soils in the Anaconda Process Area include arsenic, cadmium, chromium, copper, lead, manganese, nickel, uranium, and zinc (Ref. 22, pp. 402, 424, 446, 467, 479, 503, 520, 533, 557, 588, 617, 654, 667, 690, 702; Ref. 26, pp. 28, 34-35; Ref. 43, pp. 131-132, 135-137, 139-140, 141-143, 145-149, 154-156, 158-159, 162-166, 168). Hazardous substances in pooled water collected from concrete sump or basement areas include arsenic, cadmium, chromium, copper, lead, manganese, nickel, uranium, and zinc (Ref. 43, pp. 95, 171, 173). The Anaconda Process Area is not scored because it contains multiple source types, and because it does not affect the listing decision.

Vat Leach Tailings (VLT)

VLT from the Oxide Tailings Area (Source 11) has been widely used in the Mason Valley in asphalt and concrete, as engineered fill, and as surfacing material for highway shoulders, roads, driveways, yards, and other applications. The material has also been used extensively across the Anaconda facility as capping material (Ref. 29, p. 56; Ref. 37, p. 25). Hazardous substances associated with this source include chromium, copper, lead, manganese, nickel, uranium, and zinc (Ref. 12, pp. 573-574). This possible source is not scored, because it does not affect the listing decision.

3.0 GROUND WATER MIGRATION PATHWAY

3.0.1 GENERAL CONSIDERATIONS

Ground Water Migration Pathway Description

The Anaconda Mine site consists of releases of hazardous substances from mining operations conducted on the former Anaconda Mine property. Eleven sources are scored as part of the site. Hazardous substances associated with these sources include arsenic, cadmium, chromium, copper, lead, manganese, nickel, and/or zinc (see Section 2.2). Although uranium is documented in many of these sources, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances. An observed release of these hazardous substances is documented from the site sources to ground water of the Mason Valley Alluvial Aquifer (see Section 3.1.1).

Targets potentially affected by releases from these sources include public and private drinking water wells screened in the Mason Valley Alluvial Aquifer located within 4 miles of the site sources, and downgradient of site discontinuities formed by the Singatse Range and bedrock outcrops of the Singatse Spur (see Figure 12, Section 3.3.2.4, and the Aquifer Discontinuities Discussion below). Ground water provides 100 percent of the area's residential water. Wells located within a 4-mile radius of site sources encompass both public and private drinking water wells, including private wells located on Locust Drive and Luzier Lane adjacent to the north and northwest boundaries of the Anaconda facility (Figure 12; Ref. 3; Ref. 7; Ref. 8; Ref. 10; Ref. 30).

Regional Geology/Aquifer Description

The Anaconda site is located in the west-central portion of the Mason Valley, a Basin-and-Range-type graben filled with up to 1,000 feet of unconsolidated valley-fill deposits of Tertiary and Quaternary Age lying unconformably on a weathered surface of hydrothermally altered Tertiary volcanic and Mesozoic intrusive rocks. The unconsolidated valley fill deposits consist of an interbedded sequence of sand, gravel, cobbles, boulders, silt, and gravelly and sandy clay (Ref. 16, p. 10; Ref. 23, p. 40; Ref. 31, pp. 11, 16).

The unconsolidated deposits in the Mason Valley were derived primarily from erosion of the uplifted mountain blocks and from deposition in the floodplain of the Walker River. In addition, lacustrine deposits derived from ancestral Lake Lahontan occur north of the Anaconda site. The interfingering of alluvial fan deposits originating from drainages from the bordering mountains and the fluvial deposits from a river system that historically meandered back and forth across the valley creates a complex interbedded sequence of unconsolidated materials beneath the valley floor. The unconsolidated deposits comprise the primary aquifer in the Mason Valley. This aquifer, which is commonly referred to as the alluvial aquifer, is very productive, with many irrigation wells in the valley yielding more than 2,000 gpm (Ref. 16, p. 11; Ref. 23, pp. 40, 42).

The ground water flow system in Mason Valley consists of: 1) a heterogeneous valley-fill alluvial aquifer system comprised of laterally discontinuous confining units of clay or other low-permeability sediments and unconfined, semi-confined and confined aquifers; and 2) a relatively impermeable bedrock flow system underlying and bounding the alluvial aquifer with limited primary permeability and ground water flow focused along faults and fractures (Ref. 23, p. 49).

Hydraulic properties of the basin-fill sediments of Mason Valley vary both laterally and vertically as a result of variable depositional environments observed in the valley (Ref. 23, p. 54). Ground water in the alluvial aquifer within Mason Valley generally flows from south to north in the direction of the north-flowing Walker River. Locally, ground water flow directions are affected by: 1) bedrock outcrops within and along the margins of the valley; 2) drawdown from pumped wells; and 3) irrigation activities on cultivated fields (Ref. 23, pp. 50, 91, 236).

Site Geology/Aquifer Description:
Bedrock in the site vicinity forms a V-shaped graben structure that reaches its lowest point beneath the north end of the Hunewill Ranch fields, which are located directly north of Source 10. From its lowest elevation, bedrock rises in elevation toward the south. The V-shaped graben ends at the Yerington Pit, and the alluvial-bedrock contact is exposed on the pit walls. The bedrock exposed in the Yerington Pit is the host rock for the Yerington copper porphyry deposit. East and west of the Anaconda site sources, bedrock creates discontinuities in the alluvial aquifer where it rises to the surface as outcroppings associated with the Singatse Range on the west and Singatse Spur on the east (Ref. 23, pp. 41, 89, 232-233; Ref. 25). The Singatse Spur consists of two adjacent bedrock outcrops located east of the Anaconda site named the Ground Hog Hills and McLeod Hills (Ref. 23, p. 42).

According to the Groundwater Flow Model prepared for ARC, the valley fill alluvial aquifer system in the site vicinity consists of interbedded sands, silts, and clays that are laterally discontinuous beneath the site sources (Ref. 16, p. 16; Ref. 23, p. 56). Shallow, intermediate, and deep zones of the alluvial aquifer were identified in 1982 based on the occurrence of clay or fine silt layers encountered during drilling near the north end of the Anaconda site (Ref. 23, p. 56; Ref. 32, p. 20; Ref. 33, p. 13). However, subsequent lithologic logging of core from over 250 monitor well boreholes drilled throughout the area demonstrated that these layers are laterally discontinuous beneath the site sources. Consequently, the original site ground water zone designations based on elevation are now only used to identify and group monitor wells with similar screen intervals at the same relative depth in the aquifer, and do not indicate distinct aquifers or aquifer zones (Ref. 23, p. 56; Ref. 33, p. 13). Therefore, the alluvium beneath the site comprises a single aquifer.

Alluvial ground water in the site vicinity generally flows to the northwest. However, the alluvial ground water flow regime is locally affected by: 1) the Yerington Pit Lake, which functions as a localized hydraulic sink for alluvial and bedrock ground water; 2) bedrock in the Singatse Range west of the site, which functions as a low flux boundary to alluvial ground water; 3) bedrock outcrops on the eastern margin of the site (the Singatse Spur), which impede ground water flow from the West Campbell Ditch and the Walker River to the alluvium beneath the northern site sources; and 4) agricultural irrigation north of the site using surface water diverted from the Walker River via West Campbell Ditch (Ref. 23, pp. 57, 92). The Yerington Pit serves as a hydraulic sink and creates a cone of depression that captures alluvial and bedrock ground water, which are in hydraulic communication in this area. The lake level within the Yerington Pit is continuing to rise, and is expected to reach a steady state elevation of approximately 4,250 feet above mean sea level (amsl) around 2027 to 2028 (Ref. 23, pp. 58, 233; Ref. 33, p. 68).

The aquifer discontinuities formed by the Singatse Range and the Singatse Spur, as well as the cone of depression caused by the Yerington Pit Lake, mean that the site sources are effectively at upgradient locations within the local portion of the Mason Valley Alluvial Aquifer. Ground water beneath the majority of the site sources flows northwestward between the Singatse Range and the Singatse Spur toward neighborhoods with private drinking water wells and toward production wells of the Yerington Paiute Indian Reservation. Ground water beneath the site sources located immediately north of the Yerington Pit Lake flows southward toward the Yerington Pit Lake (Ref. 23, pp. 232-233, 240; Ref. 33, p. 902).

Aquifer/Stratum 1: Mason Valley Alluvial Aquifer

Description

The horizontal extent of the portion of the Mason Valley Alluvial Aquifer being scored includes the valley fill alluvium within the 4 mile target distance limit of the 11 site sources (see Figure 12). The Singatse Range and the Singatse Spur, where bedrock comes to the surface and the alluvium is absent, form horizontal boundaries within the 4 mile target distance limit. The vertical extent of the Mason Valley Alluvial Aquifer includes the valley fill alluvium from the ground surface to the alluvial/bedrock contact (Ref. 23, pp. 232-233).

Aquifer Interconnections/Distance from Source

Description

According to the Groundwater Flow Model prepared for ARC, the valley fill alluvial aquifer system in the site vicinity consists of interbedded sands, silts, and clays that are laterally discontinuous beneath the site sources, meaning that there are no continuous lower hydraulic conductivity layers that divide the alluvium into multiple horizontal aquifers (Ref. 16, pp. 15-16; Ref. 23, p. 56; Ref. 33, p. 13). Pump tests and water level measurements near the facility have shown that pumping of wells screened in the deep zone results in drawdown of ground water levels in the shallow zone (Ref. 21, p. 5; Ref. 31, pp. 15-16; Ref. 32, pp. 7, 22). Hazardous substances attributable to Anaconda site sources have been detected beneath the site in monitoring wells screened in the shallow, intermediate, and deep zones of the aquifer (Ref. 19, pp. 15, 24; Ref. 21, p. 42; Ref. 23, pp. 278-281, 290-292; Ref. 32, pp. 43, 48, 49; Ref. 33, pp. 908-917). Therefore, the Mason Valley Alluvial Aquifer forms a single aquifer with no laterally continuous barriers to vertical ground water flow beneath the site sources.

Aquifer Discontinuities with Target Distance Limit

Description

Bedrock in the Singatse Range west of the site functions as a low flux boundary to alluvial ground water. Bedrock outcrops of the Singatse Spur on the eastern margin of the site impede ground water flow from the West Campbell Ditch and the Walker River to the alluvium beneath the northern site sources (Ref. 23, pp. 57, 92-93). While the Yerington Pit creates a localized cone of depression, it does not entirely transect the Mason Valley Alluvial Aquifer, as alluvium is still present between the Pit Lake and the Singatse Range on the west, and between the Pit Lake and the Singatse spur to the north (Ref. 23, pp. 58, 232-233, 245).

SUMMARY OF AQUIFER BEING EVALUATED

Aquifer No.	Aquifer Name	Is Aquifer Interconnected with Upper Aquifer within 2 miles? (Y/N/NA)	Is Aquifer Continuous within 4-mile TDL? (Y/N)	Is Aquifer Karst? (Y/N)
1	Mason Valley Alluvial Aquifer	NA	N	N

3.1 LIKELIHOOD OF RELEASE

3.1.1 OBSERVED RELEASE

Aquifer Being Evaluated: Mason Valley Alluvial Aquifer

Chemical Analysis

In accordance with HRS Table 2-3, an observed release is established by chemical analysis as follows. If the background concentration is not detected (or is less than the detection limit), an observed release is established with the sample measurement equals or exceeds the detection limit. If the background concentration equals or exceeds the detection limit, an observed release is established when the sample measurement is 3 times or more above the background concentration (Ref. 1, Table 2-3, p. 51589).

Brown and Caldwell Quarterly Ground Water Sampling
ARC conducts quarterly ground water sampling throughout the area pursuant to Section 6.0 of the Scope of Work attached to the Administrative Order for Remedial Investigation and Feasibility Study for the Anaconda/Yerington Mine Site. The Administrative Order was issued by EPA to ARC on January 12, 2007 (Ref. 33, p. 7).

The current monitoring well network includes 354 active wells, including 132 wells in the shallow zone, 54 wells in the intermediate zone, 101 wells in the deep zone, and 67 bedrock wells (Ref. 33, p. 10, 80). The shallow zone wells have screened intervals that straddle the water table, or are within 50 feet of the water table, at or above 4,300 feet amsl. Screened intervals of the Intermediate zone wells are within 4,250 to 4,300 feet amsl, and Deep zone wells are below 4,250 feet amsl (Ref. 33, p. 13). Monitoring wells with screened intervals constructed in bedrock, regardless of elevation, are designated as Bedrock (bedrock “b”) wells (Ref. 33, p. 14).

The majority of the shallow zone wells were sampled using dedicated bladder pumps and low-flow sampling procedures, with the remaining wells sampled by peristaltic pump (Ref. 33, pp. 27, 31). Samples are analyzed for total and dissolved metals via EPA Methods 200.7, 200.8, and 245.1 (Ref. 33, pp. 32-33). Data collected in February 2015 from the shallow zone monitoring wells are presented below to document the observed release.

Uranium was detected in all shallow zone monitoring wells beneath and downgradient of the site to a maximum concentration of 4.1 mg/l in well MW-5S located at the intersection of Sources 5, 7, and 9 (Ref. 33, pp. 902, 913-914). However, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances. Monitoring well locations are shown in Figure 10.

- Background Concentrations:
Background levels for hazardous substances found at the Anaconda site are established below based on analytical results from ground water collected from shallow zone monitoring wells B/W-27S, B/W-64S, and B/W-83S. These wells are located along Highway 95, west of the West Campbell Ditch, northeast and cross-gradient of all sources at the Anaconda facility (Ref. 33, pp. 15-17, 902). Based on Figure 11, which presents the well locations with respect to ground water

flow, these wells are cross-gradient of site sources. Due to the cone of depression created by the Yerington Pit Lake, and because bedrock of the Singatse Spur forms ground water barriers immediately south or east of site sources, the site sources are located at the upgradient portion of the aquifer. Therefore, there are no locations in the Mason Valley Alluvial Aquifer upgradient of the site sources where it would be possible to place an upgradient monitoring well (Ref. 33, p. 902). Based on ground water flow, the cross-gradient monitoring well locations are beyond the influence of ground water from site sources, and are expected to represent the concentrations of metals in the aquifer without the influence of the historical mining activities.

All background and contaminated wells used to document the observed release are screened in the shallow zone of the Mason Valley Alluvial Aquifer (Ref. 33, pp. 15-18). Dissolved metals data from the background and release wells were all collected during the First Quarter 2015 sampling event (Ref. 33, pp. 908-909, 913-914).

Background Monitoring Well Ground Water Elevations

Sample ID	Screened Interval (feet amsl)	Ground Water Elevation (feet amsl)	Date	References
B/W-27S	4338.98 - 4318.98	4335.36	2/23/2015	Ref. 33, pp. 16, 56, 99
B/W-64S	4348.03 - 4328.03	4336.51	2/24/2015	Ref. 33, pp. 16, 57, 99
B/W-83S	4326.66 - 4306.66	4336.43	February 2015	Ref. 33, pp. 17, 36, 99

Background Monitoring Well Ground Water Concentrations

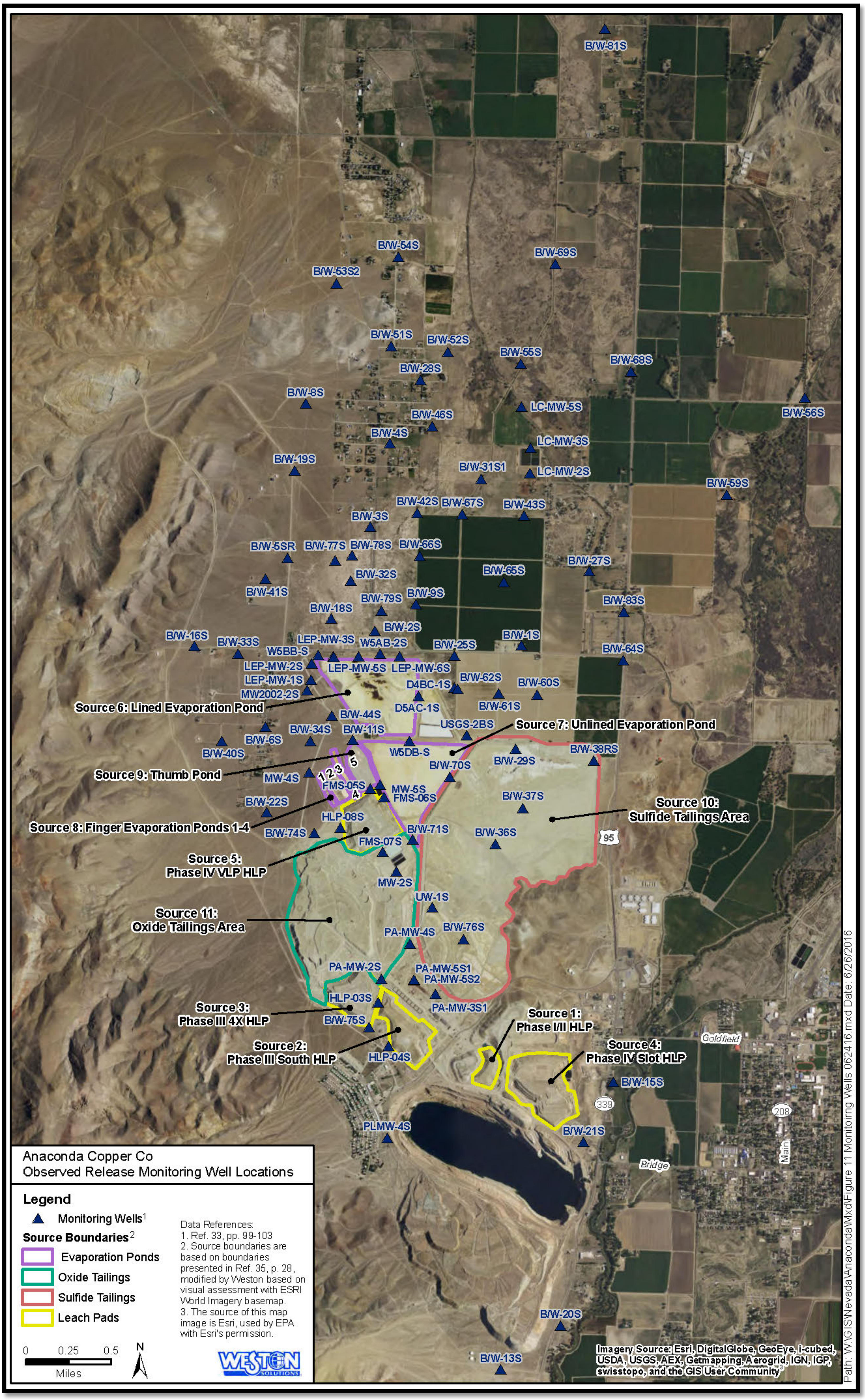
Sample ID	Sampling Date	Hazardous Substance	Dissolved Concentration (mg/l)	Method Detection Limit (mg/l)	References
B/W-27S	2/3/2015	Arsenic	0.0017	0.0005	Ref. 33, pp. 167, 544, 908, 913, 1381
		Cadmium	ND	0.00025	
		Chromium	ND	0.0005	
		Copper	0.00059 J (0.00074)	0.0005	
		Lead	NA	NA	
		Manganese	ND	0.0005	
		Nickel	ND	0.0005	
		Zinc	ND	0.0025	
B/W-64S	2/4/2015	Arsenic	0.0022	0.0005	Ref. 33, pp. 275, 588, 908, 913, 1514, 1608
		Cadmium	ND	0.00025	
		Chromium	ND	0.0005	
		Copper	0.00053 J (0.00066)	0.0005	
		Lead	NA	NA	
		Manganese	ND	0.0005	
		Nickel	ND	0.0005	
		Zinc	ND	0.0025	
B/W-83S	2/12/2015	Arsenic	0.0021	0.0005	Ref. 33, pp. 333, 550, 908, 913, 2195, 2298
		Cadmium	ND	0.00025	
		Chromium	ND	0.0005	
		Copper	ND	0.0005	
		Lead	ND	0.0005	

Background Monitoring Well Ground Water Concentrations					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Dissolved Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
		Manganese	ND	0.0005	
		Nickel	ND	0.0005	
		Zinc	0.0033 J (0.0042)	0.0025	

J:	Concentration may be qualitatively imprecise but the substance is present above detection. The direction of bias is unknown. The adjusted value, in accordance with Ref. 45, is provided in parentheses. The adjusted value is not the value EPA considers to be the correct value, but rather an estimated upper bound of the result for the purpose of demonstrating that HRS observed release criteria have been met.
NA:	Not analyzed.
ND:	Not detected.

Based on the above sampling results, the following background levels are established:

Background Levels to Establish an Observed Release		
Hazardous Substance	**Maximum Background Concentration**	**HRS Table 2-3 Background Level to Document an Observed Release by Chemical Analysis**
Arsenic	0.0022	0.0066 (3 x maximum background)
Cadmium	ND	Detection Limit
Chromium	ND	Detection Limit
Copper	0.00059 J (0.00074)	0.00222 (3 x maximum adjusted background)
Lead	ND	Detection Limit
Manganese	ND	Detection Limit
Nickel	ND	Detection Limit
Zinc	0.0033 J (0.0042)	0.0126 (3 x maximum adjusted background)



Anaconda Copper Co
Observed Release Monitoring Well Locations

Data References:
1. Ref. 33, pp. 99-103
2. Source boundaries are based on boundaries presented in Ref. 35, p. 28, modified by Weston based on visual assessment with ESRI World Imagery basemap.
3. The source of this map image is Esri, used by EPA with Esri's permission.

Imagery Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community3

Path: W:\GIS\Nevada\Anaconda\Mxd\Figure 11 Monitoring Wells 062416.mxd Date: 6/26/2016

Figure 10: Anaconda Copper Mine Observed Release Monitoring Well Locations

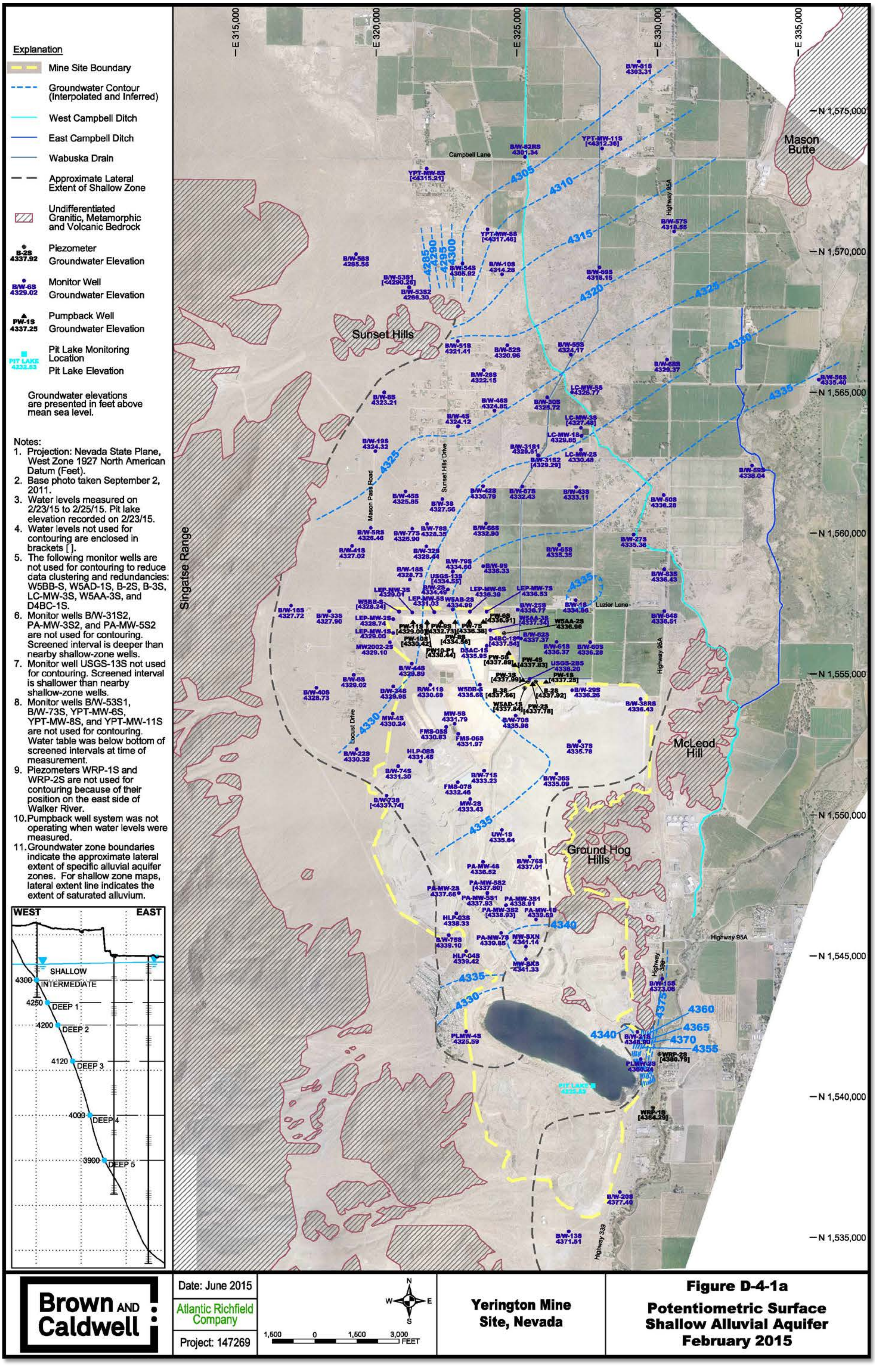


Figure 11: Potentiometric Surface, Shallow Alluvial Aquifer, February 2015 (Ref. 33, pp. 99-100; 902)

- Samples Establishing an Observed Release:
The wells listed below are located beneath and/or downgradient of Anaconda site Sources 1-11. Well locations are presented in Figure 10.

Contaminated Monitoring Well Ground Water Elevations

Sample ID	Screened Interval (feet amsl)	Ground Water Elevation (feet amsl)	Date	Reference
B/W-1S	4334.71 - 4314.71	4334.86	February 2015	Ref. 33, pp. 15, 36
B/W-2S	4330.95 - 4320.95	4334.49	2/24/2015	Ref. 33, pp. 15, 55
B/W-3S	4332.50 - 4312.50	4327.56	2/23/2015	Ref. 33, pp. 15, 55
B/W-4S	4316.74 - 4296.74	4324.12	2/23/2015	Ref. 33, pp. 15, 55
B/W-5RS	4326.12 - 4306.12	4326.46	2/24/2015	Ref. 33, pp. 15, 55
B/W-6S	4326.78 - 4306.78	4329.02	2/23/2015	Ref. 33, pp. 15, 55
B/W-8S	4325.95 - 4305.95	4323.21	2/23/2015	Ref. 33, pp. 15, 55
B/W-9S	4331.77 - 4311.77	4336.33	2/23/2015	Ref. 33, pp. 15, 55
B/W-11S	4330.42 - 4310.42	4330.69	2/24/2015	Ref. 33, pp. 15, 56
B/W-13S	4364.14 - 4344.14	4371.51	February 2015	Ref. 33, pp. 15, 37
B/W-15S	4348.48 - 4328.48	4373.06	February 2015	Ref. 33, pp. 15, 37
B/W-16S	4328.68 - 4308.68	4327.72	February 2015	Ref. 33, pp. 15, 37
B/W-18S	4333.87 - 4308.87	4328.78	2/23/2015	Ref. 33, pp. 15, 56
B/W-19S	4331.43 - 4311.43	4324.32	2/24/2015	Ref. 33, pp. 16, 56
B/W-20S	4377.44 - 4357.44	4377.40	February 2015	Ref. 33, pp. 16, 37
B/W-21S	4338.99 - 4318.99	4348.90	February 2015	Ref. 33, pp. 16, 37
B/W-22S	4309.55 - 4289.55	4330.32	2/23/2015	Ref. 33, pp. 16, 56
B/W-25S	4322.63 - 4302.63	4336.77	2/23/2015	Ref. 33, pp. 16, 56
B/W-28S	4331.67 - 4311.67	4322.15	2/24/2015	Ref. 33, pp. 16, 56
B/W-29S	4314.97 - 4294.97	4336.26	2/24/2015	Ref. 33, pp. 16, 56
B/W-31S1	4330.77 - 4315.77	4329.61	2/23/2015	Ref. 33, pp. 16, 56
B/W-32S	4328.60 - 4308.60	4328.44	2/23/2015	Ref. 33, pp. 16, 56
B/W-33S	4328.23 - 4308.23	4327.90	2/23/2015	Ref. 33, pp. 16, 56
B/W-34S	4337.68 - 4317.68	4329.95	2/24/2015	Ref. 33, pp. 16, 56
B/W-36S	4329.76 - 4319.76	4335.09	2/24/2015	Ref. 33, pp. 16, 56
B/W-37S	4331.62 - 4311.62	4335.78	2/24/2015	Ref. 33, pp. 16, 56
B/W-38RS	4320.17 - 4300.17	4336.43	2/24/2015	Ref. 33, pp. 16, 56
B/W-40S	4318.41 - 4298.41	4328.73	2/23/2015	Ref. 33, pp. 16, 56
B/W-41S	4324.54 - 4304.54	4327.02	2/24/2015	Ref. 33, pp. 16, 56
B/W-42S	4326.05 - 4306.05	4330.79	2/23/2015	Ref. 33, pp. 16, 56
B/W-43S	4323.75 - 4303.75	4333.11	February 2015	Ref. 33, pp. 16, 39
B/W-44S	4324.88 - 4304.88	4329.89	2/24/2015	Ref. 33, pp. 16, 56
B/W-46S	4327.09 - 4307.09	4324.85	2/24/2015	Ref. 33, pp. 16, 56
B/W-51S	4303.87 - 4293.87	4321.71	3/26/2015	Ref. 33, pp. 16, 56
B/W-52S	4329.90 - 4309.90	4320.96	2/24/2015	Ref. 33, pp. 16, 57

Contaminated Monitoring Well Ground Water Elevations				
Sample ID	**Screened Interval (feet amsl)**	**Ground Water Elevation (feet amsl)**	**Date**	**Reference**
B/W-53S2	4265.87 - 4255.87	4266.30	2/24/2015	Ref. 33, pp. 16, 57
B/W-54S	4298.38 - 4288.38	4305.58	3/26/2015	Ref. 33, pp. 16, 57
B/W-55S	4327.27 - 4307.27	4324.15	3/26/2015	Ref. 33, pp. 16, 57
B/W-56S	4334.12 - 4314.12	4335.40	February 2015	Ref. 33, pp. 16, 40
B/W-59S	4338.55 - 4318.55	4338.04	February 2015	Ref. 33, pp. 16, 40
B/W-60S	4342.73 - 4322.73	4336.28	2/23/2015	Ref. 33, pp. 16, 57
B/W-61S	4342.05 - 4322.05	4336.37	2/23/2015	Ref. 33, pp. 16, 57
B/W-62S	4333.94 - 4313.94	4337.37	2/23/2015	Ref. 33, pp. 16, 57
B/W-65S	4325.29 - 4305.29	4334.80	3/26/2015	Ref. 33, pp. 17, 57
B/W-66S	4313.88 - 4293.88	4332.90	2/23/2015	Ref. 33, pp. 17, 57
B/W-67S	4329.26 - 4309.26	4332.02	3/26/2015	Ref. 33, pp. 17, 57
B/W-68S	4325.57 - 4305.57	4329.11	3/26/2015	Ref. 33, pp. 17, 57
B/W-69S	4319.18 - 4299.18	4318.15	3/26/2015	Ref. 33, pp. 17, 57
B/W-70S	4338.80 - 4318.80	4335.98	2/24/2015	Ref. 33, pp. 17, 57
B/W-71S	4342.25 - 4322.25	4333.23	2/24/2015	Ref. 33, pp. 17, 57
B/W-74S	4342.98 - 4322.98	4331.30	2/24/2015	Ref. 33, pp. 17, 57
B/W-75S	4346.69 - 4326.69	4339.10	2/23/2015	Ref. 33, pp. 17, 57
B/W-76S	4335.33 - 4315.33	4337.01	2/23/2015	Ref. 33, pp. 17, 57
B/W-77S	4320.30 - 4300.30	4326.90	February 2015	Ref. 33, pp. 17, 42
B/W-78S	4329.30 - 4309.30	4328.35	February 2015	Ref. 33, pp. 17, 42
B/W-79S	4335.29 - 4315.29	4334.60	February 2015	Ref. 33, pp. 17, 36
B/W-81S	4308.10 - 4288.10	4303.32	3/26/2015	Ref. 33, pp. 17, 57
D4BC-1S	4333.98 - 4313.98	4337.54	February 2015	Ref. 33, pp. 17, 36
D5AC-1S	4332.48 - 4327.48	4335.95	February 2015	Ref. 33, pp. 17, 36
FMS-05S	4335.34 - 4315.34	4330.83	February 2015	Ref. 33, pp. 17, 36
FMS-06S	4336.55 - 4316.55	4331.97	February 2015	Ref. 33, pp. 17, 36
FMS-07S	4337.75 - 4317.75	4332.46	February 2015	Ref. 33, pp. 17, 37
HLP-03S	4341.79 - 4321.79	4338.33	February 2015	Ref. 33, pp. 17, 37
HLP-04S	4340.55 - 4320.55	4339.42	February 2015	Ref. 33, pp. 17, 37
HLP-08S	4331.83 - 4311.83	4331.45	February 2015	Ref. 33, pp. 17, 37
LC-MW-2S	NR - 4313.90	4330.48	February 2015	Ref. 33, pp. 17, 37
LC-MW-3S	NR - 4323.70	4327.48	February 2015	Ref. 33, pp. 17, 37
LC-MW-5S	NR - 4323.10	4326.77	February 2015	Ref. 33, pp. 17, 37
LEP-MW-1S	4330.92 - 4320.92	4329.00	February 2015	Ref. 33, pp. 17, 37
LEP-MW-2S	4331.46 - 4321.46	4328.74	2/24/2015	Ref. 33, pp. 17, 58
LEP-MW-3S	4333.75 - 4323.75	4329.01	February 2015	Ref. 33, pp. 17, 38
LEP-MW-5S	4336.35 - 4326.35	4331.03	February 2015	Ref. 33, pp. 17, 38
LEP-MW-6S	4327.51 - 4317.51	4336.39	February 2015	Ref. 33, pp. 17, 38

Contaminated Monitoring Well Ground Water Elevations				
Sample ID	**Screened Interval (feet amsl)**	**Ground Water Elevation (feet amsl)**	**Date**	**Reference**
MW-2S	4326.61 - 4311.61	4333.43	February 2015	Ref. 33, pp. 17, 38
MW-4S	4325.68 - 4310.68	4330.24	2/24/2015	Ref. 33, pp. 17, 58
MW-5S	4330.79 - 4315.79	4331.79	2/24/2015	Ref. 33, pp. 17, 58
MW2002-2S	4323.78 - 4313.78	4329.10	2/24/2015	Ref. 33, pp. 17, 58
PA-MW-2S	4347.37 - 4327.37	4337.66	2/23/2015	Ref. 33, pp. 18, 58
PA-MW-3S1	4348.13 - 4328.13	4338.91	2/23/2015	Ref. 33, pp. 18, 58
PA-MW-4S	4348.09 - 4328.09	4336.52	February 2015	Ref. 33, pp. 18, 39
PA-MW-5S1	4344.01 - 4324.01	4337.93	2/24/2015	Ref. 33, pp. 18, 58
PA-MW-5S2	4311.16 - 4301.16	4337.80	2/24/2015	Ref. 33, pp. 18, 58
PLMW-4S	4319.72 - 4289.72	4325.59	2/23/2015	Ref. 33, pp. 18, 58
USGS-2BS	4326.34 - 4324.44	4338.20	2/24/2015	Ref. 33, pp. 18, 58
UW-1S	4333.32 - 4313.32	4335.64	February 2015	Ref. 33, pp. 18, 40
W5AB-2S	4337.68 - 4322.68	4334.99	2/24/2015	Ref. 33, pp. 18, 58
W5BB-S	4337.12 - 4307.12	4328.24	February 2015	Ref. 33, pp. 18, 40
W5DB-S	4345.06 - 4325.06	4335.66	2/24/2015	Ref. 33, pp. 18, 58

NR: Not recorded

Ground Water Monitoring Results Documenting an Observed Release

Sample ID	Sampling Date	Hazardous Substance	Dissolved Concentration (mg/l)	Method Detection Limit (mg/l)	References
B/W-1S	2/3/2015	Chromium	0.002	0.0005	Ref. 33, pp. 111, 614, 908, 913, 1383-1384, 1469
B/W-2S	2/17/2015	Arsenic	0.019	0.0005	Ref. 33, pp. 117, 608, 908, 913, 2679, 2802
		Manganese	0.370	0.0005	
B/W-3S	2/18/2015	Arsenic	0.032	0.0005	Ref. 33, pp. 120, 566, 908, 913, 2860-2861, 2960
		Manganese	0.025	0.0005	
B/W-4S	2/9/2015	Arsenic	0.0066	0.0005	Ref. 33, pp. 123, 561, 908, 913, 1862, 1962
B/W-5RS	2/9/2015	Arsenic	0.029	0.0005	Ref. 33, pp. 126, 617, 908, 913, 1733-1734, 1817
		Chromium	0.0064	0.0005	
B/W-6S	2/17/2015	Arsenic	0.068	0.0005	Ref. 33, pp. 129, 624, 908, 913, 2684-2685, 2814
B/W-8S	2/9/2015	Arsenic	0.015	0.0005	Ref. 33, pp. 132, 617, 908, 913, 1856-1857, 1949
		Chromium	0.0046	0.0005	
B/W-9S	2/4/2015	Arsenic	0.042	0.0005	Ref. 33, pp. 135, 571, 908, 913, 1513, 1604
B/W-11S	2/2/2015	Arsenic	0.040	0.0025	Ref. 33, pp. 140, 559, 908, 913, 1226, 1239, 1343
		Cadmium	0.0092	0.0013	
		Copper	1.4	0.0025	
		Manganese	15	0.0025	
		Nickel	0.210	0.0025	
		Zinc	0.690	0.013	
B/W-13S	2/11/2015	Arsenic	0.015	0.0005	Ref. 33, pp. 142, 620, 908, 913, 2193, 2294
B/W-15S	2/2/2015	Manganese	0.510	0.0005	Ref. 33, pp. 143, 570, 908, 913, 1238, 1342
B/W-16S	2/9/2015	Arsenic	0.021	0.0005	Ref. 33, pp. 144, 618, 908, 913, 1860, 1957
		Chromium	0.011	0.0005	
B/W-18S	2/12/2015	Arsenic	0.025	0.0005	Ref. 33, pp. 148,620, 908, 913, 2195, 2299
		Manganese	0.080	0.0005	
B/W-19S	2/12/2015	Arsenic	0.018	0.0005	Ref. 33, pp. 151, 620, 908, 913, 2328-2329, 2393
		Chromium	0.0058	0.0005	
B/W-20S	2/16/2015	Arsenic	0.012	0.0005	Ref. 33, pp. 152, 579, 908, 913, 2563-2564, 2625
		Manganese	0.350	0.0005	
B/W-21S	2/16/2015	Arsenic	0.0076	0.0005	Ref. 33, pp. 153, 579, 908, 913, 2565, 2628
B/W-22S	2/18/2015	Arsenic	0.0089	0.0005	Ref. 33, pp. 155, 624, 908, 913, 2690-2691, 2827
B/W-25S	2/5/2015	Arsenic	0.021	0.0005	Ref. 33, pp. 159, 560, 908, 913, 1638, 1692
		Chromium	0.0022	0.0005	
B/W-28S	2/2/2015	Arsenic	0.013	0.0005	Ref. 33, pp. 170, 570, 908, 913, 1235-1236, 1335

Ground Water Monitoring Results Documenting an Observed Release					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Dissolved Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
B/W-29S	2/15/2015	Cadmium	0.004	0.0005	Ref. 33, pp. 174, 621, 908, 913, 2423, 2433, 2522
		Copper	0.100	0.0005	
		Manganese	22	0.05	
		Nickel	0.140	0.0005	
		Zinc	0.180	0.0025	
B/W-31S1	2/10/2015	Arsenic	0.042	0.0005	Ref. 33, pp. 180, 548, 908, 913, 1866-1867
		Copper	0.0047	0.0005	
		Manganese	0.015	0.0005	
B/W-32S	2/3/2015	Arsenic	0.410	0.0025	Ref. 33, pp. 185, 544, 908, 913, 1244, 1355
		Manganese	5.300	0.0025	
B/W-33S	2/16/2015	Arsenic	0.052	0.0005	Ref. 33, pp. 189, 608, 908, 913, 2563, 2624
		Chromium	0.0038	0.0005	
		Manganese	0.0013	0.0005	
B/W-34S	2/15/2015	Arsenic	0.043	0.0005	Ref. 33, pp. 193, 564, 908, 913, 2432, 2519
		Copper	0.1	0.0005	
B/W-36S	2/5/2015	Manganese	0.690	0.0005	Ref. 33, pp. 195, 589, 908, 913, 1630, 1636
B/W-37S	2/15/2015	Arsenic	0.045	0.0005	Ref. 33, pp. 199, 595, 908, 913, 2439, 2535
		Copper	0.004	0.0005	
		Manganese	0.045	0.0005	
B/W-38RS	2/17/2015	Manganese	0.0015	0.0005	Ref. 33, pp. 203, 597, 908, 913, 2683-2684, 2812
B/W-40S	2/9/2015	Arsenic	0.052	0.0005	Ref. 33, pp. 207, 561, 908, 913, 1856, 1947
		Chromium	0.0041	0.0005	
B/W-41S	2/11/2015	Arsenic	0.019	0.0005	Ref. 33, pp. 211, 605, 908, 913, 2027-2028, 2145
B/W-42S	2/11/2015	Arsenic	0.020	0.0005	Ref. 33, pp. 214, 550, 908, 913, 2177, 2189, 2285
		Copper	0.0046	0.0005	
B/W-43S	2/11/2015	Manganese	0.099	0.0005	Ref. 33, pp. 215, 550, 908, 913, 2194-2195, 2297
B/W-44S	2/11/2015	Arsenic	0.058	0.0005	Ref. 33, pp. 219,562, 908, 913, 2031, 2152
B/W-46S	2/15/2015	Arsenic	0.009	0.0005	Ref. 33, pp. 225, 607, 908, 913, 2431, 2518
B/W-51S	2/9/2015	Arsenic	0.021	0.0005	Ref. 33, pp. 232, 603, 908, 913, 1859, 1954
		Chromium	0.0044	0.0005	
B/W-52S	2/9/2015	Arsenic	0.0091	0.0005	Ref. 33, pp. 235, 603, 908, 913, 1735-1736, 1822
B/W-53S2	2/9/2015	Arsenic	0.013	0.0005	Ref. 33, pp. 238, 575, 908, 913, 1854, 1944
		Chromium	0.0038	0.0005	
B/W-54S	2/10/2015	Arsenic	0.019	0.0005	Ref. 33, pp. 241, 604, 908, 913, 2021, 2130

Ground Water Monitoring Results Documenting an Observed Release					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Dissolved Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
B/W-55S	2/18/2015	Manganese	0.100	0.0005	Ref. 33, pp. 244, 580, 908, 913, 2862, 2963
B/W-56S	2/16/2015	Arsenic	0.024	0.0005	Ref. 33, pp. 245, 908, 913, 2557, 2564, 2627
		Manganese	1.3	0.0005	
B/W-59S	2/19/2015	Arsenic	0.0083	0.0005	Ref. 33, pp. 256, 908, 913, 3001-3002, 3034
		Manganese	2.3	0.0005	
B/W-60S	2/4/2015	Arsenic	0.019	0.0005	Ref. 33, pp. 261, 545, 587, 908, 913, 1480, 1511, 1601
B/W-61S	2/3/2015	Arsenic	0.023	0.0005	Ref. 33, pp. 265, 613, 908, 913, 1241, 1348
B/W-62S	2/5/2015	Arsenic	0.076	0.0005	Ref. 33, pp. 271, 560, 908, 913, 1515-1516, 1592, 1611
		Copper	0.0043	0.0005	
B/W-65S	2/4/2015	Copper	0.0028	0.0005	Ref. 33, pp. 279, 614, 908, 913, 1384, 1470
		Manganese	0.0066	0.0005	
B/W-66S	2/3/2015	Arsenic	0.017	0.0005	Ref. 33, pp. 283, 559, 908, 913, 1379, 1458
		Copper	0.0028	0.0005	
		Manganese	0.440	0.0005	
B/W-67S	2/10/2015	Arsenic	0.0081	0.0005	Ref. 33, pp. 287, 549, 908, 913, 2025-2026, 2140
		Manganese	0.0029	0.0005	
B/W-68S	2/19/2015	Manganese	0.440	0.0005	Ref. 33, pp. 291, 599, 908, 913, 2871-2872, 2985
B/W-69S	2/17/2015	Manganese	0.330	0.0005	Ref. 33, pp. 296, 552, 908, 913, 2661, 2677, 2797
B/W-70S	2/15/2015	Arsenic	0.018	0.0025	Ref. 33, pp. 300, 578, 908, 913, 2438-2439, 2534
		Cadmium	0.034	0.0013	
		Copper	2.4	0.0025	
		Manganese	220	0.250	
		Nickel	1.4	0.0025	
		Zinc	2.7	0.013	
B/W-71S	2/16/2015	Arsenic	0.098	0.0025	Ref. 33, pp. 305, 564, 908, 913, 2430, 2442, 2541
		Cadmium	0.056	0.0013	
		Copper	4.7	0.0025	
		Manganese	48	0.250	
		Nickel	0.910	0.0025	
		Zinc	4.3	0.013	
B/W-74S	2/10/2015	Arsenic	0.011	0.001	Ref. 33, pp. 312, 562, 908, 913, 2025, 2138
		Chromium	0.0028	0.002	
		Manganese	0.0021	0.001	
B/W-75S	2/16/2015	Arsenic	0.013	0.0005	Ref. 33, pp. 314, 623, 908, 913, 2564, 2626
B/W-76S	2/8/2015	Manganese	0.0082	0.0005	Ref. 33, pp. 317, 561, 908, 913, 1726, 1801

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Sample ID	Sampling Date	Hazardous Substance	Dissolved Concentration (mg/l)	Method Detection Limit (mg/l)	References
B/W-77S	2/2/2015	Arsenic	0.680	0.0025	Ref. 33, pp. 318, 544, 908, 913, 1233, 1329
		Copper	0.0074	0.0025	
		Manganese	1.0	0.0025	
B/W-78S	2/5/2015	Manganese	0.025	0.0005	Ref. 33, pp. 319, 546, 908, 913, 1641-1642, 1700
B/W-79S	2/17/2015	Arsenic	0.028	0.0005	Ref. 33, pp. 320, 552, 908, 913, 2565-2566, 2630
		Manganese	0.370	0.0005	
B/W-81S	2/19/2015	Manganese	2.1	0.0005	Ref. 33, pp. 324, 625, 908, 913, 2869, 2980
D4BC-1S	2/15/2015	Arsenic	0.027	0.0005	Ref. 33, pp. 334, 595, 908, 913, 2437, 2530
		Copper	0.0035	0.0005	
D5AC-1S	2/15/2015	Arsenic	0.017	0.005	Ref. 33, pp. 335, 578, 908, 913, 2432-2433, 2521
		Copper	0.0098	0.005	
		Manganese	23	0.5	
		Nickel	0.023	0.005	
		Zinc	0.016	0.025	
FMS-05S	2/3/2015	Arsenic	0.041	0.005	Ref. 33, pp. 336, 544, 909, 914, 1230, 1243, 1352
		Cadmium	0.092	0.0025	
		Chromium	0.039	0.005	
		Copper	31	0.005	
		Lead	0.015	0.005	
		Manganese	110	0.005	
		Nickel	3.1	0.005	
		Zinc	8.7	0.025	
FMS-06S	2/2/2015	Arsenic	0.091	0.005	Ref. 33, pp.337, 544, 909, 914, 1225, 1237-1238, 1340
		Cadmium	0.100	0.0025	
		Copper	7.1	0.005	
		Lead	0.010	0.005	
		Manganese	120	0.005	
		Nickel	2.1	0.005	
		Zinc	7.4	0.025	
FMS-07S	2/3/2015	Arsenic	0.039	0.005	Ref. 33, pp. 338, 544, 909, 914, 1228, 1241, 1347
		Cadmium	0.040	0.0025	
		Manganese	56	0.005	
		Nickel	0.290	0.005	
		Zinc	1.9	0.025	
HLP-03S	2/15/2015	Arsenic	0.012	0.0005	Ref. 33, pp. 343, 552, 909, 914, 2434, 2524
HLP-04S	2/9/2015	Arsenic	0.0068	0.0005	Ref. 33, pp. 344, 548, 909, 914, 1861, 1960

Ground Water Monitoring Results Documenting an Observed Release					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Dissolved Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
HLP-08S	2/9/2015	Arsenic	0.0068	0.0005	Ref. 33, pp. 352, 547, 909, 914, 1857, 1950
		Manganese	0.190	0.0005	
		Nickel	0.0023	0.0005	
LC-MW-2S	2/11/2015	Manganese	0.029	0.0005	Ref. 33, pp. 353, 577, 909, 914, 2194, 2296
LC-MW-3S	2/11/2015	Manganese	0.0016	0.0005	Ref. 33, pp. 355, 577, 909, 914, 2188, 2281
LC-MW-5S	2/18/2015	Manganese	0.016	0.0005	Ref. 33, pp. 356, 580, 909, 914, 2668, 2685-2686, 2817
LEP-MW-1S	2/19/2015	Arsenic	0.087	0.0005	Ref. 33, pp. 357, 566, 909, 914, 2868, 2978
LEP-MW-2S	2/2/2015	Arsenic	0.015	0.0005	Ref. 33, pp. 361, 629, 909, 914, 1227, 1240, 1345
LEP-MW-3S	2/17/2015	Arsenic	0.012	0.0005	Ref. 33, pp. 362, 565, 909, 914, 2681, 2806
		Manganese	0.460	0.0005	
		Nickel	0.0042	0.0005	
LEP-MW-5S	2/15/2015	Arsenic	0.068	0.0005	Ref. 33, pp. 364, 578, 909, 914, 2436-2437, 2529
		Copper	0.0028	0.0005	
		Manganese	0.023	0.0005	
LEP-MW-6S	2/18/2015	Manganese	2.7	0.0005	Ref. 33, pp. 598, 909, 914, 2867, 2975
		Nickel	0.0067	0.0005	
MW-2S	2/18/2015	Arsenic	0.190	0.0025	Ref. 33, pp. 375, 609, 909, 914, 2851, 2865, 2971
		Cadmium	0.032	0.0013	
		Copper	1.3	0.0025	
		Manganese	16	0.0025	
		Nickel	0.400	0.0025	
		Zinc	2.3	0.013	
MW-4S	2/16/2015	Arsenic	0.016	0.0005	Ref. 33, pp. 378, 564, 909, 914, 2674, 2789
		Copper	0.028	0.0005	
MW-5S	2/2/2015	Arsenic	0.120	0.01	Ref. 33, pp. 383, 613, 909, 914, 1223, 1235, 1334
		Cadmium	0.110	0.005	
		Chromium	0.100	0.01	
		Copper	95	0.01	
		Manganese	130	0.01	
		Nickel	3.7	0.01	
		Zinc	11	0.05	
MW2002-2S	2/16/2015	Arsenic	0.071	0.0005	Ref. 33, pp. 385, 622, 909, 914, 2562, 2622
PA-MW-2S	2/12/2015	Arsenic	0.037	0.0005	Ref. 33, pp. 390, 594, 909, 914, 2333-2334, 2404
PA-MW-3S1	2/10/2015	Arsenic	0.0089	0.0005	Ref. 33, pp. 393, 592, 909, 914, 1867, 1973
		Manganese	0.0053	0.0005	

Ground Water Monitoring Results Documenting an Observed Release

Sample ID	Sampling Date	Hazardous Substance	Dissolved Concentration (mg/l)	Method Detection Limit (mg/l)	References
PA-MW-4S	2/11/2015	Arsenic	0.044	0.0005	Ref. 33, pp. 398, 593, 909, 914, 2175, 2188, 2282
		Manganese	3.6	0.0005	
		Nickel	0.0059	0.0005	
PA-MW-5S1	2/9/2015	Arsenic	0.0074	0.0005	Ref. 33, pp. 400, 591, 909, 914, 1723, 1735
		Manganese	2.9	0.0005	
		Nickel	0.0071	0.0005	
PA-MW-5S2	2/8/2015	Manganese	12	0.0005	Ref. 33, pp. 401, 590, 909, 914, 1721-1722, 1732, 1814
		Nickel	0.018	0.0005	
PLMW-4S	2/11/2015	Arsenic	0.018	0.0005	Ref. 33, pp. 409, 619, 909, 914, 2187, 2279
USGS-2BS	2/3/2015	Cadmium	0.013	0.0005	Ref. 33, pp. 422, 570, 909, 914, 1229, 1243, 1351
		Copper	0.750	0.0005	
		Manganese	49	0.05	
		Nickel	0.440	0.0005	
		Zinc	0.640	0.025	
UW-1S	2/18/2015	Arsenic	0.013	0.0005	Ref. 33, pp. 424, 609, 909, 914, 2847-2848, 2861, 2961
		Manganese	10	0.05	
		Nickel	0.057	0.0005	
W5AB-2S	2/18/2015	Arsenic	0.007	0.0005	Ref. 33, pp. 433, 598, 909, 914, 2860, 2959
		Cadmium	0.0046	0.00025	
		Copper	0.015	0.0005	
		Manganese	48	0.05	
		Nickel	0.100	0.0005	
		Zinc	0.039	0.0025	
W5BB-S	2/18/2015	Arsenic	0.0093	0.0005	Ref. 33, pp. 435, 598, 909, 914, 2688-2689, 2822
		Chromium	0.0046	0.0005	
W5DB-S	2/2/2015	Arsenic	0.044	0.01	Ref. 33, pp. 441, 613, 909, 914, 1227, 1239-1240, 1344
		Cadmium	0.130	0.005	
		Copper	29	0.01	
		Manganese	270	0.5	
		Nickel	4.1	1.0	
		Zinc	12	0.05	

Attribution

Arsenic, cadmium, chromium, copper, lead, manganese, nickel, and zinc were detected in Sources 1 through 11 (see Section 2.2.2 of this documentation record). An observed release of arsenic, cadmium, chromium, copper, lead, manganese, nickel, and zinc is documented from the Anaconda site to the Mason Valley Alluvial Aquifer based on chemical analysis (see Observed Release tables) (Ref. 33, pp. 902-904). Establishing an observed release by chemical analysis generally requires documenting that the concentration of at least one hazardous substance in a release sample is significantly increased above its background level, and that the release in that substance’s concentration can be attributed to the site (Ref. 1, pp. 59-60). If the background concentration is not detected (or is less than the detection limit), a significant increase is established when the sample measurement equals or exceeds the sample quantitation limit (Ref. 1, pp. 59-60). If the background concentration equals or exceeds the detection limit, a significant increase is established when the sample measurement is 3 times or more above the background concentration and above the sample quantitation limit (Ref. 1, pp. 59-60).

Metals are naturally-occurring substances that would be expected to be elevated in ground water in a mining area due to the presence of ore bodies in the subsurface. The selection of background sampling locations accounts for any potential naturally occurring levels of metals in ground water by representing the concentrations of metals without the influence of mining. Background levels for hazardous substances found at the Anaconda site are established based on analytical results from ground water collected from shallow zone monitoring wells B/W-27S, B/W-64S, and B/W-83S. These wells are located along Highway 95, west of the West Campbell Ditch, northeast and cross-gradient of all sources at the Anaconda facility (Ref. 33, pp. 15-17, 902). Based on Figure 11, which presents the well locations with respect to ground water flow, these wells are cross-gradient of site sources. Due to the cone of depression created by the Yerington Pit Lake, and because bedrock of the Singatse Spur forms ground water barriers immediately south or east of site sources, the site sources are located at the upgradient portion of the aquifer. Therefore, there are no locations in the Mason Valley Alluvial Aquifer upgradient of the site sources where it would be possible to place an upgradient monitoring well (Ref. 33, p. 902). Based on ground water flow, the cross-gradient monitoring well locations are beyond the influence of ground water from site sources, and are expected to represent the concentrations of metals in the aquifer without the influence of the historical mining activities.

All background and contaminated wells used to document the observed release are screened in the shallow zone of the Mason Valley Alluvial Aquifer (Ref. 33, pp. 15-18). Dissolved metals data from the background and release wells were all collected during the First Quarter 2015 sampling event. Contaminated monitoring wells located beneath and downgradient of site sources contain hazardous substances at concentrations significantly above background (Ref. 33, pp. 908-909, 913-914).

A 2008 Phase I report did not find evidence of other nearby sites that could be sources of these hazardous substances (Ref. 47, pp. 22-24). If there are no other possible sources of contamination, then it is more likely that at least some part of the significant increase of contamination is from the site sources.

The evidence provided in this section of the HRS documentation record for the former Anaconda Mine property documents that the observed release has occurred by chemical analysis of ground water samples to the Mason Valley Alluvial Aquifer of the hazardous substances listed below.

Hazardous Substances Released

An observed release of arsenic, cadmium, chromium, copper, lead, manganese, nickel, and zinc is documented by chemical analysis.

Ground Water Observed Release Factor Value: 550

OTHER CONTAMINATION NOT SCORED

ARC has conducted quarterly ground water sampling of domestic wells north and west of the Anaconda facility since 2003 as part of a Drinking Water Monitoring Program (DWMP) (Ref. 40, p. 8). As of the March 2015 sampling event, 208 domestic wells were included in this program, though ARC had only obtained access agreements for 179 of them, and 154 of these were sampled (Ref. 40, p. 10-11). Based on results from the March 2015 sampling event, most sampled domestic wells contained elevated concentrations of hazardous substances attributable to the Anaconda site (see table below). However, these wells are being scored as potential target wells, rather than actual, because the background levels are for dissolved concentrations and the domestic well sampling results are in total concentrations, and because the screened intervals of many of these wells are unknown (Ref. 40, pp. 16-23). In addition, scoring these wells as actual targets, rather than potential, does not affect the listing decision. Analytical results from these wells are presented for informational purposes only, and are not used to establish an observed release or actual contamination. Analytical results from the domestic wells are not comparable to the monitoring well results above, because the monitoring well results are presented as dissolved concentrations, while the domestic well results are presented as total concentrations.

The domestic well sampling program is conducted pursuant to Section 6.0 of the Scope of Work attached to the Administrative Order for Remedial Investigation and Feasibility Study for the Anaconda/Yerington Mine Site. The Administrative Order was issued by EPA to ARC on January 12, 2007 (Ref. 40, p. 5). During the 1Q 2015 sampling event (March 9 through 12, 2015), domestic well water samples were collected from 154 domestic wells. Samples were submitted for analysis of physical parameters and cations/anions, total organic carbon, metals, and radionuclides. Samples were analyzed for total metals via EPA Methods 200.7 and 200.8 (Ref. 40, pp. 24-26).

Well locations are presented in Figure 12. To preserve the privacy of local residents, domestic wells are identified by sample number only. Well addresses are provided in a confidential reference (Ref. 30).

Domestic Well Monitoring Results					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Total Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
DW-1	3/10/2015	Arsenic	0.050	0.0005	Ref. 40, pp. 298, 328, 504, 708, 778
DW-2	3/11/2015	Arsenic	0.0066	0.0005	Ref. 40, pp. 320, 329, 504, 1056, 1176
		Manganese	0.0017	0.0005	
		Uranium	0.074	0.0005	
		Zinc	0.026	0.0025	
DW-3	3/9/2015	Arsenic	0.011	0.0005	Ref. 40, pp. 316, 330, 504, 547, 661
		Uranium	0.027	0.0005	
DW-4	3/10/2015	Manganese	0.0075	0.0005	Ref. 40, pp. 297, 331, 504, 700-701, 762
		Uranium	0.020	0.0005	
		Zinc	0.036	0.0025	
DW-5	3/11/2015	Arsenic	0.0076	0.0005	Ref. 40, pp. 319, 332, 504, 852, 1006
		Copper	0.0021	0.0005	
		Manganese	0.0023	0.0005	
		Uranium	0.072	0.0005	
		Zinc	0.031	0.0025	
DW-6	3/10/2015	Manganese	0.0015	0.0005	Ref. 40, pp. 298, 333, 504, 831, 957
		Uranium	0.027	0.0005	
DW-7	3/10/2015	Arsenic	0.0083	0.0005	Ref. 40, pp. 317, 334, 504, 702, 766
		Copper	0.0012	0.0005	
		Manganese	0.0021	0.0005	
		Uranium	0.062	0.0005	
		Zinc	0.130	0.0025	
DW-10	3/9/2015	Arsenic	0.012	0.0005	Ref. 40, pp. 316, 336, 504, 549-550, 667
		Copper	0.0045	0.0005	
		Lead	0.0011	0.0005	
		Uranium	0.040	0.0005	
DW-11	3/10/2015	Arsenic	0.013	0.0005	Ref. 40, pp. 318, 337, 504, 841, 981
		Chromium	0.002	0.0005	
		Uranium	0.012	0.0005	
		Zinc	0.014	0.0025	
DW-13	3/9/2015	Arsenic	0.0076	0.0005	Ref. 40, pp. 296, 339, 504, 548-549, 664
		Uranium	0.058	0.0005	
DW-14	3/11/2015	Manganese	0.0018	0.0005	Ref. 40, pp. 312, 340, 504, 1051-1052, 1165
		Uranium	0.031	0.0005	
		Zinc	0.047	0.0025	
DW-15	3/10/2015	Arsenic	0.019	0.0005	Ref. 40, pp. 311, 341, 504, 707, 776
		Chromium	0.0021	0.0005	
		Copper	0.0054	0.0005	
		Manganese	0.0019	0.0005	
		Uranium	0.024	0.0005	
		Zinc	0.019	0.0025	

Domestic Well Monitoring Results					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Total Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
DW-16	3/12/2015	Arsenic	0.0075	0.0005	Ref. 40, pp. 313, 342, 504, 1059, 1182,
		Manganese	0.002	0.0005	
		Uranium	0.052	0.0005	
		Zinc	0.016	0.0025	
DW-18	3/12/2015	Arsenic	0.010	0.0005	Ref. 40, pp. 301, 344, 504, 1064, 1194,
		Chromium	0.0041	0.0005	
		Copper	0.0054	0.0005	
		Lead	0.0017	0.0005	
		Manganese	0.016	0.0005	
		Uranium	0.022	0.0005	
DW-19	3/10/2015	Arsenic	0.010	0.0005	Ref. 40, pp. 318, 345, 504, 835, 966
		Manganese	0.0032	0.0005	
		Uranium	0.020	0.001	
		Zinc	0.022	0.0025	
DW-21	3/10/2015	Arsenic	0.034	0.0005	Ref. 40, pp. 318, 347, 504, 836, 969
		Chromium	0.0023	0.0005	
		Manganese	0.0022	0.0005	
		Uranium	0.0095	0.0005	
		Zinc	0.023	0.0025	
DW-23	3/10/2015	Arsenic	0.011	0.0005	Ref. 40, pp. 298, 349, 504, 838-839, 974
		Manganese	0.0011	0.0005	
		Uranium	0.045	0.0005	
		Zinc	0.012	0.01	
DW-25	3/11/2015	Copper	0.0017	0.0005	Ref. 40, pp. 312, 351, 504, 1047-1048, 1155
		Manganese	0.015	0.0005	
		Uranium	0.069	0.0005	
		Zinc	0.190	0.0025	
DW-26	3/10/2015	Copper	0.0015	0.0005	Ref. 40, pp. 317, 352, 504, 701, 763
		Manganese	0.0074	0.0005	
		Uranium	0.077	0.0005	
DW-28	3/11/2015	Arsenic	0.0073	0.0005	Ref. 40, pp. 319, 354, 504, 846, 992
		Manganese	0.0012	0.0005	
		Uranium	0.020	0.0005	
DW-29	3/11/2015	Arsenic	0.0076	0.0005	Ref. 40, pp. 319, 355, 504, 848, 998
		Manganese	0.009	0.0005	
		Uranium	0.021	0.0005	
DW-30	3/11/2015	Arsenic	0.0093	0.0005	Ref. 40, pp. 319, 356, 504, 847, 995
		Copper	0.0024	0.0005	
		Manganese	0.0052	0.0005	
		Uranium	0.019	0.0005	
		Zinc	0.110	0.0025	

Domestic Well Monitoring Results

Sample ID	Sampling Date	Hazardous Substance	Total Concentration (mg/l)	Method Detection Limit (mg/l)	References
DW-31	3/10/2015	Arsenic	0.030	0.0005	Ref. 40, pp. 306, 357, 504, 700, 761, 784
		Chromium	0.0036	0.0005	
		Uranium	0.016	0.0005	
DW-32	3/11/2015	Arsenic	0.014	0.0005	Ref. 40, pp. 312, 358, 504, 848-849, 999
DW-34	3/11/2015	Arsenic	0.020	0.0005	Ref. 40, pp. 319, 359, 504, 1045, 1150
		Chromium	0.0051	0.0005	
		Manganese	0.0025	0.0005	
		Uranium	0.036	0.0005	
		Zinc	0.083	0.0025	
DW-38	3/10/2015	Arsenic	0.036	0.0005	Ref. 40, pp. 297, 362, 504, 704-705, 770
		Copper	0.0029	0.0005	
		Manganese	0.0052	0.0005	
		Uranium	0.033	0.0005	
		Zinc	0.053	0.0025	
DW-40	3/10/2015	Arsenic	0.008	0.0005	Ref. 40, pp. 318, 364, 504, 709, 780
		Manganese	0.015	0.0005	
		Uranium	0.025	0.0005	
		Zinc	0.015	0.0025	
DW-41	3/11/2015	Manganese	0.0017	0.0005	Ref. 40, pp. 319, 365, 504, 850, 1003
		Uranium	0.036	0.0005	
		Zinc	0.042	0.0025	
DW-42	3/12/2015	Arsenic	0.016	0.0005	Ref. 40, pp. 320, 366, 504, 1063, 1190
		Copper	0.0018	0.0005	
		Manganese	0.0023	0.0005	
		Uranium	0.021	0.0005	
DW-45	3/11/2015	Arsenic	0.0068	0.0005	Ref. 40, pp. 312, 369, 504, 1049, 1158
		Manganese	0.0014	0.0005	
		Uranium	0.025	0.0005	
DW-46	3/12/2015	Copper	0.0039	0.0005	Ref. 40, pp. 320, 370, 504, 1061, 1186
		Manganese	0.0024	0.0005	
		Uranium	0.043	0.0005	
DW-47	3/10/2015	Arsenic	0.030	0.0005	Ref. 40, pp. 311, 371, 504, 703, 767, 785
		Manganese	0.0037	0.0005	
		Uranium	0.025	0.0005	
		Zinc	0.027	0.0025	
DW-49	3/10/2015	Arsenic	0.024	0.0005	Ref. 40, pp. 311, 373, 504, 834, 964
		Manganese	0.018	0.0005	
		Uranium	0.020	0.0005	
		Zinc	0.023	0.0025	

Domestic Well Monitoring Results					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Total Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
DW-50	3/10/2015	Arsenic	0.019	0.0005	Ref. 40, pp. 318, 374, 504, 840, 977
		Chromium	0.0028	0.0005	
		Copper	0.0028	0.0005	
		Manganese	0.0039	0.0005	
		Uranium	0.042	0.0005	
		Zinc	0.089	0.0025	
DW-51	3/12/2015	Arsenic	0.010	0.0005	Ref. 40, pp. 301, 375, 504, 1057-1058, 1179
		Uranium	0.010	0.0005	
		Zinc	0.014	0.0025	
DW-53	3/12/2015	Copper	0.010	0.0005	Ref. 40, pp. 313, 377, 504, 1061, 1187
		Manganese	0.0038	0.0005	
		Uranium	0.039	0.0005	
DW-54	3/10/2015	Arsenic	0.047	0.0005	Ref. 40, pp. 297, 378, 504, 706-707, 775
		Chromium	0.0028	0.0005	
		Copper	0.001	0.0005	
		Uranium	0.028	0.0005	
		Zinc	0.033	0.0025	
DW-55	3/10/2015	Arsenic	0.018	0.0005	Ref. 40, pp. 306, 379, 504, 832, 959
		Uranium	0.0097	0.0005	
DW-57	3/10/2015	Arsenic	0.024	0.0005	Ref. 40, pp. 306, 380, 504, 843, 985
		Uranium	0.025	0.0005	
		Zinc	0.014	0.0025	
DW-58	3/10/2015	Copper	0.0026	0.0005	Ref. 40, pp. 298, 381, 504, 844, 987
		Manganese	0.0051	0.0005	
		Uranium	0.014	0.0005	
DW-61	3/10/2015	Copper	0.0096	0.0005	Ref. 40, pp. 306, 383, 504, 831, 956
		Uranium	0.060	0.0005	
		Zinc	0.062	0.0025	
DW-62	3/12/2015	Arsenic	0.0079	0.0005	Ref. 40, pp. 313, 384, 504, 1059-1060, 1183
		Manganese	0.0011	0.0005	
		Uranium	0.056	0.0005	
		Zinc	0.085	0.0025	
DW-64	3/9/2015	Arsenic	0.035	0.0005	Ref. 40, pp. 311, 386, 504, 553-554, 677
		Manganese	0.0021	0.0005	
		Uranium	0.018	0.0005	
DW-65	3/12/2015	Arsenic	0.032	0.0005	Ref. 40, pp. 308, 387, 504, 1059, 1181
		Copper	0.0014	0.0005	
		Manganese	0.0042	0.0005	
		Uranium	0.014	0.0005	

Domestic Well Monitoring Results					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Total Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
DW-67	3/10/2015	Arsenic	0.017	0.0005	Ref. 40, pp. 318, 388, 504, 829, 953
		Copper	0.0031	0.0005	
		Manganese	0.0018	0.0005	
		Uranium	0.0088	0.0005	
		Zinc	0.011	0.0025	
DW-68	3/11/2015	Copper	0.0031	0.0005	Ref. 40, pp. 319, 389, 504, 1050, 1162
		Manganese	0.0056	0.0005	
		Uranium	0.022	0.0005	
		Zinc	0.054	0.0025	
DW-70	3/10/2015	Arsenic	0.011	0.0005	Ref. 40, pp. 318, 390, 504, 833, 962
		Copper	0.0031	0.0005	
		Manganese	0.0053	0.0005	
		Uranium	0.047	0.0005	
		Zinc	0.017	0.0025	
DW-72	3/12/2015	Arsenic	0.032	0.0005	Ref. 40, pp. 320, 391, 504, 1060, 1184
		Chromium	0.0066	0.0005	
		Uranium	0.043	0.0005	
		Zinc	0.014	0.0025	
DW-73	3/9/2015	Arsenic	0.031	0.0005	Ref. 40, pp. 296, 392, 504, 542-543, 651
		Chromium	0.003	0.0005	
		Uranium	0.011	0.0005	
DW-74	3/9/2015	Arsenic	0.026	0.0005	Ref. 40, pp. 311, 393, 504, 550, 668
		Chromium	0.0022	0.0005	
		Uranium	0.019	0.0005	
DW-75	3/9/2015	Arsenic	0.027	0.0005	Ref. 40, pp. 311, 394, 504, 553, 676
		Manganese	0.010	0.0005	
		Uranium	0.017	0.0005	
DW-76	3/10/2015	Arsenic	0.016	0.0005	Ref. 40, pp. 311, 395, 504, 709-710, 781
		Manganese	0.0017	0.0005	
		Uranium	0.023	0.0005	
		Zinc	0.027	0.0025	
DW-77	3/10/2015	Arsenic	0.015	0.0005	Ref. 40, pp. 311, 396, 504, 832-833, 960
		Copper	0.016	0.0005	
		Lead	0.0014	0.0005	
		Uranium	0.023	0.0005	
DW-78	3/12/2015	Arsenic	0.051	0.0005	Ref. 40, pp. 320, 397, 504, 1058, 1180
		Chromium	0.0026	0.0005	
		Uranium	0.025	0.0005	
DW-79	3/11/2015	Copper	0.0045	0.0005	Ref. 40, pp. 299, 398, 504, 848, 997
		Manganese	0.013	0.0005	
		Uranium	0.033	0.0005	
		Zinc	0.160	0.0025	

Domestic Well Monitoring Results					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Total Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
DW-85	3/11/2015	Copper	0.0012	0.0005	Ref. 40, pp. 312, 399, 504, 1050, 1161
		Manganese	0.0033	0.0005	
		Uranium	0.079	0.0005	
		Zinc	0.120	0.0025	
DW-86	3/11/2015	Manganese	0.0049	0.0005	Ref. 40, pp. 312, 400, 504, 1055-1056, 1175
		Uranium	0.067	0.0005	
		Zinc	0.100	0.0025	
DW-87	3/11/2015	Arsenic	0.013	0.0005	Ref. 40, pp. 319, 401, 504, 1049, 1159
		Chromium	0.0051	0.0005	
		Copper	0.0018	0.0005	
		Manganese	0.0034	0.0005	
		Uranium	0.047	0.0005	
DW-88	3/11/2015	Arsenic	0.013	0.0005	Ref. 40, pp. 320, 402, 504, 1055, 1174
		Manganese	0.0017	0.0005	
		Uranium	0.020	0.0005	
		Zinc	0.063	0.0025	
DW-89	3/10/2015	Arsenic	0.0097	0.0005	Ref. 40, pp. 317, 403, 504, 707-708, 777
		Copper	0.0024	0.0005	
		Uranium	0.049	0.0005	
		Zinc	0.042	0.0025	
DW-90	3/11/2015	Arsenic	0.0068	0.0005	Ref. 40, pp. 319, 404, 504, 1055, 1173
		Manganese	0.0049	0.0005	
		Uranium	0.064	0.0005	
		Zinc	0.095	0.0025	
DW-91	3/9/2015	Arsenic	0.030	0.0005	Ref. 40, pp. 311, 405, 504, 547-548, 638, 663
		Uranium	0.014	0.0005	
DW-92	3/10/2015	Copper	0.0016	0.0005	Ref. 40, pp. 298, 406, 504, 830, 954
		Uranium	0.022	0.0005	
		Zinc	0.080	0.0025	
DW-96	3/10/2015	Copper	0.0062	0.0005	Ref. 40, pp. 317, 409, 504, 706, 774, 787
		Manganese	0.0016	0.0005	
		Uranium	0.036	0.0005	
		Zinc	0.017	0.0025	
DW-98	3/10/2015	Arsenic	0.022	0.0005	Ref. 40, pp. 318, 410, 504, 837, 972
		Chromium	0.0031	0.0005	
		Copper	0.0013	0.0005	
		Manganese	0.0018	0.0005	
		Uranium	0.011	0.0005	
		Zinc	0.038	0.0025	

Domestic Well Monitoring Results					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Total Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
DW-102	3/10/2015	Arsenic	0.017	0.0005	Ref. 40, pp. 297, 412, 504, 693, 702, 765
		Copper	0.0049	0.0005	
		Manganese	0.001	0.0005	
		Uranium	0.020	0.0005	
DW-103	3/12/2015	Arsenic	0.015	0.0005	Ref. 40, pp. 301, 413, 504, 1063-1064, 1192
		Uranium	0.0092	0.0005	
DW-104	3/9/2015	Arsenic	0.0084	0.0005	Ref. 40, pp. 316, 414, 504, 553, 675
		Uranium	0.032	0.0005	
DW-105	3/10/2015	Copper	0.0022	0.0005	Ref. 40, pp. 318, 415, 504, 830, 955
		Manganese	0.018	0.0005	
		Uranium	0.054	0.0005	
		Zinc	0.065	0.0025	
DW-108	3/11/2015	Manganese	0.0019	0.0005	Ref. 40, pp. 300, 417, 504, 1053, 1169
		Uranium	0.033	0.0005	
		Zinc	0.030	0.0025	
DW-109	3/11/2015	Manganese	0.013	0.0005	Ref. 40, pp. 299, 418, 504, 849, 1000
		Uranium	0.018	0.0005	
		Zinc	0.130	0.0025	
DW-112	3/11/2015	Copper	0.0034	0.0005	Ref. 40, pp. 319, 420, 504, 1052, 1167
		Manganese	0.0019	0.0005	
		Uranium	0.051	0.0005	
		Zinc	0.100	0.0025	
DW-113	3/10/2015	Arsenic	0.042	0.0005	Ref. 40, pp. 298, 421, 504, 708-709, 779
		Manganese	0.0043	0.0005	
DW-114	3/10/2015	Arsenic	0.034	0.0005	Ref. 40, pp. 306, 422, 504, 839, 975
		Copper	0.0031	0.0005	
		Uranium	0.0091	0.0005	
		Zinc	0.052	0.0025	
DW-115	3/11/2015	Arsenic	0.013	0.0005	Ref. 40, pp. 312, 423, 504, 847, 996
		Manganese	0.003	0.0005	
DW-116	3/9/2015	Arsenic	0.046	0.0005	Ref. 40, pp. 311, 424, 504, 545-546, 658
		Chromium	0.0024	0.0005	
		Uranium	0.016	0.0005	
DW-117	3/11/2015	Copper	0.0039	0.0005	Ref. 40, pp. 300, 425, 504, 1051, 1164
		Manganese	0.0021	0.0005	
		Uranium	0.038	0.0005	
		Zinc	0.021	0.0025	

Domestic Well Monitoring Results					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Total Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
DW-118	3/10/2015	Copper	0.0052	0.0005	Ref. 40, pp. 298, 426, 504, 842, 983
		Manganese	0.017	0.0005	
		Uranium	0.031	0.0005	
		Zinc	0.035	0.0025	
DW-119	3/11/2015	Copper	0.0014	0.0005	Ref. 40, pp. 300, 427, 504, 1053, 1168
		Manganese	0.0014	0.0005	
		Uranium	0.035	0.0005	
DW-122	3/11/2015	Manganese	0.0034	0.0005	Ref. 40, pp. 312, 430, 504, 1057, 1178
		Uranium	0.027	0.0005	
DW-123	3/10/2015	Arsenic	0.015	0.0005	Ref. 40, pp. 297, 431, 504, 701-702, 764
		Uranium	0.042	0.0005	
		Zinc	0.012	0.0025	
DW-124	3/9/2015	Arsenic	0.036	0.0005	Ref. 40, pp. 311, 432, 504, 551-552, 672
		Chromium	0.0023	0.0005	
		Uranium	0.018	0.0005	
DW-125	3/10/2015	Arsenic	0.032	0.0005	Ref. 40, pp. 311, 433, 504, 835, 967
		Copper	0.0032	0.0005	
		Uranium	0.021	0.0005	
		Zinc	0.014	0.0025	
DW-126	3/10/2015	Arsenic	0.010	0.0005	Ref. 40, pp. 311, 434, 504, 844, 988
		Manganese	0.0024	0.0005	
		Zinc	0.058	0.0025	
DW-128	3/9/2015	Arsenic	0.022	0.0005	Ref. 40, pp. 296, 435, 504, 546, 659
		Copper	0.002	0.0005	
		Uranium	0.021	0.0005	
DW-129	3/10/2015	Arsenic	0.015	0.0005	Ref. 40, pp. 297, 436, 504, 704, 769
		Uranium	0.030	0.0005	
DW-130	3/10/2015	Arsenic	0.020	0.0005	Ref. 40, pp. 306, 437, 504, 836, 968
		Copper	0.510	0.0005	
		Lead	0.079	0.0005	
		Manganese	0.0015	0.0005	
		Uranium	0.023	0.0005	
		Zinc	0.410	0.0025	
DW-132	3/10/2015	Arsenic	0.034	0.0005	Ref. 40, pp. 311, 438, 504, 705-706, 772, 786
		Copper	0.0042	0.0005	
		Manganese	0.0018	0.0005	
		Uranium	0.020	0.0005	
		Zinc	0.039	0.0025	

Domestic Well Monitoring Results					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Total Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
DW-133	3/11/2015	Arsenic	0.013	0.0005	Ref. 40, pp. 307, 439, 504, 1046, 1152
		Chromium	0.0027	0.0005	
		Manganese	0.011	0.0005	
		Uranium	0.0097	0.0005	
		Zinc	0.021	0.0025	
DW-134	3/12/2015	Arsenic	0.012	0.0005	Ref. 40, pp. 313, 440, 504, 1060, 1185
		Chromium	0.0028	0.0005	
		Manganese	0.0033	0.0005	
		Uranium	0.036	0.0005	
DW-135	3/10/2015	Arsenic	0.017	0.0005	Ref. 40, pp. 311, 441, 504, 840-841, 979
		Chromium	0.0075	0.0005	
		Uranium	0.062	0.0005	
DW-136	3/10/2015	Arsenic	0.024	0.0005	Ref. 40, pp. 306, 442, 504, 842, 982
		Copper	0.042	0.0005	
		Lead	0.0022	0.0005	
		Uranium	0.030	0.0005	
		Zinc	0.024	0.0025	
DW-138	3/11/2015	Arsenic	0.0094	0.0005	Ref. 40, pp. 312, 443, 504, 1045, 1151
		Uranium	0.019	0.0005	
DW-139	3/10/2015	Arsenic	0.011	0.0005	Ref. 40, pp. 311, 444, 504, 842-843, 984
		Chromium	0.0021	0.0005	
		Copper	0.0033	0.0005	
		Uranium	0.028	0.0005	
		Zinc	0.030	0.0025	
DW-140	3/11/2015	Arsenic	0.022	0.0005	Ref. 40, pp. 307, 445, 504, 1047, 1154
		Chromium	0.0039	0.0005	
		Uranium	0.016	0.0005	
		Zinc	0.018	0.0025	
DW-146	3/11/2015	Copper	0.021	0.0005	Ref. 40, pp. 307, 449, 504, 1049-1050, 1160
		Lead	0.0021	0.0005	
		Manganese	0.0018	0.0005	
		Uranium	0.009	0.0005	
		Zinc	0.190	0.0025	
DW-147	3/11/2015	Arsenic	0.010	0.0005	Ref. 40, pp. 312, 450, 504, 1053-1054, 1170
		Manganese	0.0021	0.0005	
		Uranium	0.023	0.0005	
		Zinc	0.044	0.0025	

Domestic Well Monitoring Results					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Total Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
DW-148	3/10/2015	Arsenic	0.013	0.0005	Ref. 40, pp. 297, 451, 504, 706, 773
		Copper	0.0022	0.0005	
		Manganese	0.0013	0.0005	
		Uranium	0.029	0.0005	
		Zinc	0.038	0.0025	
DW-149	3/10/2015	Arsenic	0.057	0.0005	Ref. 40, pp. 311, 452, 504, 838, 973
		Chromium	0.0053	0.0005	
		Copper	0.0012	0.0005	
		Manganese	0.0034	0.0005	
		Uranium	0.014	0.0005	
		Zinc	0.016	0.0025	
DW-151	3/10/2015	Arsenic	0.017	0.0005	Ref. 40, pp. 298, 454, 504, 710, 782
		Manganese	0.0036	0.0005	
DW-152	3/11/2015	Arsenic	0.011	0.0005	Ref. 40, pp. 312, 455, 504, 850, 1002
		Uranium	0.021	0.0005	
DW-153	3/12/2015	Manganese	0.0034	0.0005	Ref. 40, pp. 313, 456, 504, 1062, 1189
		Uranium	0.044	0.0005	
DW-154	3/11/2015	Manganese	0.0093	0.0005	Ref. 40, pp. 312, 457, 504, 1057, 1177
		Uranium	0.039	0.0005	
		Zinc	0.130	0.0025	
DW-157	3/9/2015	Arsenic	0.011	0.0005	Ref. 40, pp. 316, 458, 504, 552, 673
		Uranium	0.037	0.0005	
DW-159	3/12/2015	Copper	0.0011	0.0005	Ref. 40, pp. 320, 460, 504, 1062, 1188
		Lead	0.0012	0.0005	
		Manganese	0.0021	0.0005	
		Uranium	0.079	0.0005	
		Zinc	0.250	0.0025	
DW-162	3/11/2015	Manganese	0.0034	0.0005	Ref. 40, pp. 319, 463, 504, 1046, 1153
		Uranium	0.048	0.0005	
		Zinc	0.130	0.0025	
DW-164	3/10/2015	Arsenic	0.0071	0.0005	Ref. 40, pp. 298, 465, 504, 836-837, 970
		Copper	0.0037	0.0005	
		Manganese	0.0022	0.0005	
		Uranium	0.027	0.0005	
		Zinc	0.075	0.0025	
DW-165	3/10/2015	Manganese	0.0017	0.0005	Ref. 40, pp. 298, 466, 504, 834, 963
		Uranium	0.029	0.0005	
		Zinc	0.190	0.0025	
DW-166	3/9/2015	Arsenic	0.0087	0.0005	Ref. 40, pp. 296, 467, 504, 550-551, 669
		Lead	0.025	0.0005	
		Uranium	0.014	0.0005	

Domestic Well Monitoring Results					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Total Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
DW-168	3/10/2015	Arsenic	0.0066	0.0005	Ref. 40, pp. 298, 468, 504, 833, 961
		Copper	0.0014	0.0005	
		Manganese	0.016	0.0005	
		Uranium	0.033	0.0005	
		Zinc	0.270	0.0025	
DW-169	3/11/2015	Arsenic	0.013	0.0005	Ref. 40, pp. 307, 469, 504, 1048, 1156
		Chromium	0.004	0.0005	
		Copper	0.0023	0.0005	
		Uranium	0.012	0.0005	
DW-170	3/11/2015	Arsenic	0.018	0.0005	Ref. 40, pp. 307, 470, 504, 1048, 1157
		Chromium	0.0032	0.0005	
		Manganese	0.003	0.0005	
		Uranium	0.011	0.0005	
DW-173	3/9/2015	Lead	0.0021	0.0005	Ref. 40, pp. 296, 471, 504, 554-555, 678
		Manganese	0.035	0.0005	
		Uranium	0.013	0.0005	
		Zinc	0.140	0.0025	
DW-175	3/11/2015	Copper	0.0021	0.0005	Ref. 40, pp. 299, 472, 504, 846, 993
		Manganese	0.0053	0.0005	
		Uranium	0.045	0.0005	
DW-176	3/11/2015	Copper	0.0011	0.0005	Ref. 40, pp. 299, 473, 504, 849, 1001
		Manganese	0.005	0.0005	
		Uranium	0.050	0.0005	
		Zinc	0.020	0.0025	
DW-178	3/11/2015	Manganese	0.0015	0.0005	Ref. 40, pp. 300, 474, 504, 1054, 1171
		Uranium	0.023	0.0005	
DW-180	3/9/2015	Copper	0.016	0.0005	Ref. 40, pp. 305, 475, 504, 538, 642
DW-181	3/10/2015	Arsenic	0.019	0.0005	Ref. 40, pp. 306, 476, 504, 834-835, 965, 1008
		Copper	0.0032	0.0005	
		Uranium	0.030	0.0005	
DW-183	3/10/2015	Copper	0.001	0.0005	Ref. 40, pp. 317, 478, 504, 705, 771
		Uranium	0.035	0.0005	
		Zinc	0.017	0.0025	
DW-184	3/10/2015	Arsenic	0.024	0.0005	Ref. 40, pp. 306, 479, 504, 840, 978
		Copper	0.018	0.0005	
		Lead	0.0013	0.0005	
		Manganese	0.0011	0.0005	
		Uranium	0.031	0.0005	
		Zinc	0.019	0.0025	

Domestic Well Monitoring Results					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Total Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
DW-185	3/9/2015	Arsenic	0.0081	0.0005	Ref. 40, pp. 305, 480, 504, 547, 662
		Lead	0.0033	0.0005	
		Uranium	0.030	0.0005	
DW-186	3/10/2015	Copper	0.0013	0.0005	Ref. 40, pp. 298, 481, 504, 841, 980
		Manganese	0.0028	0.0005	
		Uranium	0.026	0.0005	
		Zinc	0.039	0.0025	
DW-187	3/10/2015	Copper	0.0034	0.0005	Ref. 40, pp. 298, 482, 504, 844-845, 989
		Manganese	0.0023	0.0005	
		Uranium	0.032	0.0005	
		Zinc	0.092	0.0025	
DW-193	3/10/2015	Arsenic	0.015	0.0005	Ref. 40, pp. 306, 483, 504, 837, 971
		Manganese	0.0018	0.0005	
		Uranium	0.040	0.0005	
DW-194	3/11/2015	Arsenic	0.021	0.0005	Ref. 40, pp. 307, 484, 504, 1052, 1166
		Copper	0.004	0.0005	
		Uranium	0.025	0.0005	
DW-195	3/10/2015	Copper	0.0017	0.0005	Ref. 40, pp. 298, 485, 504, 843, 986
		Manganese	0.027	0.0005	
		Uranium	0.032	0.0005	
DW-197	3/9/2015	Arsenic	0.0074	0.0005	Ref. 40, pp. 305, 487, 504, 546, 660
		Uranium	0.052	0.0005	
DW-198	3/9/2015	Arsenic	0.015	0.0005	Ref. 40, pp. 296, 488, 504, 549, 665
		Uranium	0.016	0.0005	
DW-199	3/11/2015	Arsenic	0.025	0.0005	Ref. 40, pp. 307, 489, 504, 1051, 1163
		Lead	0.0019	0.0005	
		Manganese	0.0018	0.0005	
		Uranium	0.025	0.0005	
		Zinc	0.027	0.0025	
DW-201	3/9/2015	Arsenic	0.0098	0.0005	Ref. 40, pp. 305, 490, 504, 545, 657
		Lead	0.0038	0.0005	
		Uranium	0.030	0.0005	
DW-204	3/9/2015	Uranium	0.035	0.0005	Ref. 40, pp. 305, 493, 504, 552, 674
DW-205	3/9/2015	Uranium	0.042	0.0005	Ref. 40, pp. 305, 494, 504, 551, 671
DW-206	3/11/2015	Copper	0.0028	0.0005	Ref. 40, pp. 299, 495, 504, 851, 1004
		Manganese	0.015	0.0005	
		Uranium	0.040	0.0005	
		Zinc	0.019	0.0025	

Domestic Well Monitoring Results					
Sample ID	**Sampling Date**	**Hazardous Substance**	**Total Concentration (mg/l)**	**Method Detection Limit (mg/l)**	**References**
DW-207	3/9/2015	Lead	0.0023	0.0005	Ref. 40, pp. 305, 496, 504, 540-541, 647, 11740
		Manganese	0.0053	0.0005	
		Uranium	0.057	0.0005	
		Zinc	0.026 J-	0.0025	
DW-208	3/11/2015	Copper	0.0022	0.0005	Ref. 40, pp. 300, 497, 504, 851, 1005
		Manganese	0.008	0.0005	
		Uranium	0.068	0.0005	
		Zinc	0.015	0.0025	
DW-209	3/9/2015	Arsenic	0.018	0.0005	Ref. 40, pp. 305, 498, 504, 533, 549, 666
		Uranium	0.013	0.0005	
DW-210	3/10/2015	Copper	0.0012	0.0005	Ref. 40, pp. 298, 499, 504, 839, 976
		Uranium	0.042	0.0005	
		Zinc	0.015	0.0005	
WDW018	3/12/2015	Arsenic	0.025	0.0005	Ref. 40, pp. 313, 501, 504, 1063, 1191
		Uranium	0.033	0.0005	
Well 4	3/11/2015	Arsenic	0.011	0.0005	Ref. 40, pp. 299, 502, 504, 845, 991
		Copper	0.006	0.0005	
		Lead	0.0036	0.0005	
		Manganese	0.001	0.0005	
		Uranium	0.037	0.0005	
		Zinc	0.140	0.0025	

3.1.2 POTENTIAL TO RELEASE

Potential to Release was not scored, because an Observed Release was established.

3.2 WASTE CHARACTERISTICS

The waste characteristics factor category includes hazardous waste quantity, toxicity, and ground water mobility for the hazardous substances documented in the site sources.

3.2.1 TOXICITY/MOBILITY

HRS Toxicity and Mobility Factor Values are presented below for the hazardous substances documented in Sources 1 through 11. Toxicity Factor Values are provided in the Superfund Chemical Data Matrix (Ref. 2).

Hazardous Substance**	Source No.	Toxicity Factor Value	Mobility Factor Value	Does Haz. Substance Meet Observed Release? (Y/N)	Toxicity/ Mobility (Table 3-9)	Reference
Arsenic	1-6, 8-11	10,000	1*	Y	10,000	Ref. 2, p. 1
Cadmium	1-7, 11	10,000	1*	Y	10,000	Ref. 2, p. 2
Chromium	1-7, 8-11	10,000	1*	Y	10,000	Ref. 2, p. 3
Copper	1-7, 8-11	100	1*	Y	100	Ref. 2, p. 4
Lead	1-7, 8-9, 11	10,000	1*	Y	10,000	Ref. 2, p. 5
Manganese	1-7, 8-11	10,000	1*	Y	10,000	Ref. 2, p. 6
Nickel	1-7, 8-11	10,000	1*	Y	10,000	Ref. 2, p. 7
Zinc	1-7, 8-11	10	1*	Y	10	Ref. 2, p. 9

* Hazardous substances meeting the criteria for observed release by chemical analysis receive a mobility factor value of 1 (Ref. 1, section 3.2.1.2).

** Although uranium is documented in multiple sources, radioactivity and the related risk to human health and the environment is not being evaluated as part of the site score because the site score is sufficient for the site to qualify for the NPL without evaluating radioactive substances

Toxicity/Mobility Factor Value: 10,000
(Ref. 1, Table 3-9)

3.2.2 HAZARDOUS WASTE QUANTITY

Calculations for hazardous waste quantities for each source are presented in Section 2.4.2 for Sources 1 through 11.

Source No.	Source Type	Source Hazardous Waste Quantity (see Section 2.4.2, Sources 1 through 11)
1	Pile	46,910.8
2	Pile	154,135.4
3	Pile	167,538.5
4	Pile	288,166.2
5	Pile	180,941.5
6	Pile	24,441.8
7	Pile	108,092.5
8	Pile	3,790.6
9	Pile	156,292.1
10	Pile	8,400,000
11	Pile	32,234,146.8
	sum:	41,764,456.2

Hazardous Waste Quantity Factor Value: 10,000
(Ref. 1, Table 2-6)

3.2.3 WASTE CHARACTERISTICS FACTOR CATEGORY VALUE

Toxicity/Mobility Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 10,000

Toxicity/Mobility Factor Value X Hazardous Waste Quantity Factor Value: 100,000,000

Waste Characteristics Factor Category Value (subject to a maximum of 100): 100
(Ref. 1, Table 2-7)

3.3 TARGETS

To preserve the privacy of local residents, private wells are identified by sample number only. Well locations and owners are provided in a confidential reference (Ref. 30).

3.3.1 NEAREST WELL

The Nearest Well factor evaluates the drinking water well drawing from the aquifer being evaluated that is located nearest to site sources (Ref. 1, Section 3.3.1, p. 51602).

Well ID: Wells DW-051 and DW-131. These wells are located approximately 335feet from the Lined Evaporation Pond (Source 6) (Figure 12; Ref. 3; Ref. 10).

Level of Contamination (I, II, or potential): Potential. Sampling data are not available for this well so Level I or II actual contamination is not documented.

Nearest Well Factor Value: 20
(Ref. 1, Table 3-11)

3.3.2 POPULATION

Ground water provides 100 percent of the area’s residential water (Ref. 3; Ref. 5; Ref. 8, Ref. 10). Wells located within the aquifer being scored at the site include both public and private drinking water wells, including private wells located on Locust Drive and Luzier Lane adjacent to the north and northwest boundaries of the Anaconda facility (Ref. 3; Ref. 5 Ref. 8; Ref. 10; Ref. 30). Within a 4-mile radius of the site sources, there are at least 8 active public drinking water wells that serve a total population of approximately 6,375 people (Figure 12; Ref. 3; Ref. 5; Ref. 8; Ref. 10), and at least 188 private drinking water wells that serve a population of approximately 487 people (Ref. 27; Ref. 30; Ref. 40, pp. 10-12, 16-23, 54). The number of active private drinking water wells was calculated by excluding public, irrigation and inactive wells, as well as wells greater than 4 miles from the site, from the 208 wells included in the ARC DWMP (Figure 12; Ref. 5; Ref. 40, pp. 10-12). The population drinking from these wells was calculated by multiplying the number of wells by the 2009-2013 census figure of 2.59 persons per household (Ref. 27).

Since March 2004, ARC has provided bottled water to many of the residents with private domestic wells located downgradient of the Anaconda site. Eligibility for domestic well owners to be included in the Bottled Water Program is based on a uranium concentration of 25 μg/L (Ref. 40, pp. 6, 28, 32-43).

Private and public drinking water wells screened in the aquifer being evaluated within the target distance limit from the site are shown on Figure 12.

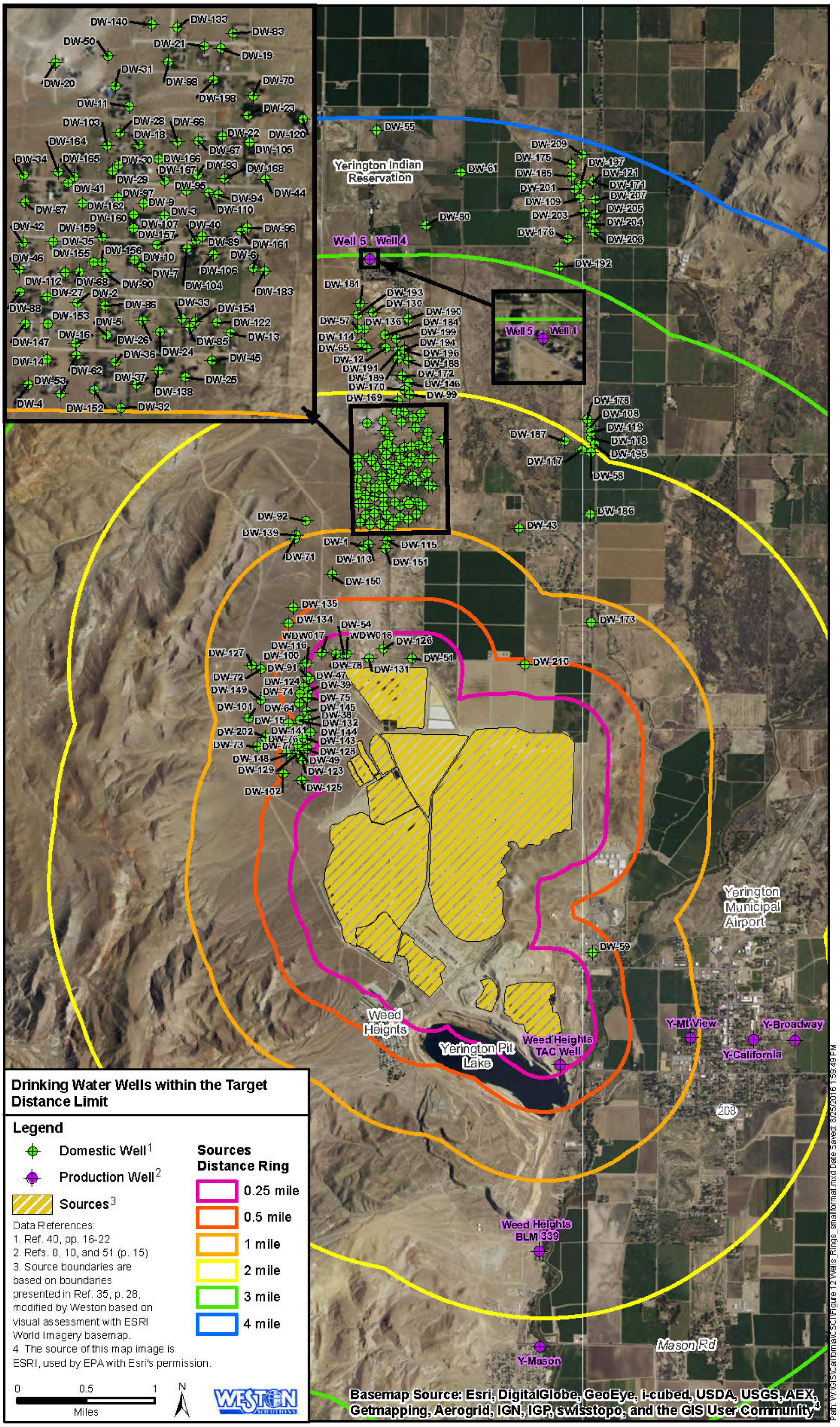

Figure 12: Drinking Water Wells within the Target Distance Limit

3.3.2.1 Level of Contamination

3.3.2.2 Level I Concentrations

ARC has conducted ground water sampling of domestic wells north and west of the Anaconda site since December 2003 (Ref. 40, p. 8). As of the March 2015 sampling event, 208 domestic wells were included in this program, though ARC had only obtained access agreements for 179 of them, and 154 of these were sampled (Ref. 40, pp. 10, 12). Based on results from the March 2015 sampling event, most of the 154 sampled domestic wells exceeded the cancer risk screening concentration benchmark for arsenic and/or the MCL for uranium (see table in Other Contamination Section) (Ref. 2, pp. 1, 8). However, these wells are being scored as potential target wells, rather than actual, because of the difficulty of establishing appropriate background contamination levels for these wells and because the screened intervals of many of these wells are unknown (Ref. 40, pp. 16-23). In addition, scoring these wells as potential targets, rather than actual, does not affect the listing decision.

3.3.2.3 Level II Concentrations

As stated above, domestic wells are being scored as potential target wells, rather than actual, because of the difficulty of establishing appropriate background contamination levels for these wells and because the screened intervals of many of these wells are unknown (Ref. 40, pp. 16-23). In addition, scoring these wells as potential targets, rather than actual, does not affect the listing decision.

3.3.2.4 Potential Contamination

Three municipalities have public water systems located within 4 miles of sources at the site. The municipalities are the City of Yerington, the Weed Heights Development, and the Yerington Indian Reservation (Ref. 5; Ref. 8; Ref. 10). Each municipality's water supply system is described below.

City of Yerington
The water supply for the City of Yerington is provided by a public works municipal system and services a total population of 5,000 people (Ref. 8). The system currently has four active wells:

Well Name	Gallons Per Minute (gpm)	Percentage of Supply	Apportioned Population*	Reference
Mountain View Well	1,000	20.83%	5,000 * 25% = 1,250	Ref. 8
Broadway Well	1,500	31.25%	5,000 * 25% = 1,250	
California Well	1,500	31.25%	5,000 * 25% = 1,250	
Mason Road Well	800	16.67%	5,000 * 25% = 1,250	

*: Because no well exceeds 40 percent of the supply, population for each well is apportioned equally (Ref. 1, Section 3.3.2)

All of the wells draw from the Mason Valley Alluvial Aquifer (Ref. 8). Each well operates independently, although if more than one well is pulling water at the same time, the water is blended within the tank prior to distribution. All four wells are located within 4 miles of the site (Figure 12; Ref. 3; Ref. 8).

Weed Heights Development
The water supply for the Weed Heights Development is supplied by the Weed Heights Development Municipal System and serves a total population of 800 people (Ref. 10). The system is serviced by two wells that draw from the Mason Valley Alluvial Aquifer. The wells are not blended but run one at a time, six months each. Both wells are located within the aquifer being evaluated at this site (Figure 12; Ref. 3; Ref. 10; Ref. 51, p. 15).

Well Name	Percentage of Supply	Associated Population	Reference
Weed Heights TAC	50%	800 * 0.5 = 400	Ref. 10
Weed Heights BLM 339	50%	800 * 0.5 = 400	Ref. 10

Yerington Paiute Indian Reservation
The water supply for the Yerington Paiute Indian Reservation is provided by a municipal system that serves a total population of 575 people. The system is comprised of five wells (only two of which are active) that are located in a cluster south of Campbell Lane. The two active wells are Well 4 and Well 5. All of the wells draw from the Mason Valley Alluvial Aquifer. Both active wells are located within 4 miles of the site (Ref. 5). Well 4 was sampled during the March 2015 sampling event, and exceeded the cancer risk screening concentration for arsenic and the MCL for uranium (Ref. 2, pp. 1, 8; Ref. 40, p. 845). Sampling data for Well 5 are unknown.

The Tribal water system runs off a lead and lag system. Well 5 is the lead and operates 100 percent of the time. Well 4 is the lag, so it only runs when demand exceeds the pump rate of

Well 5. When the wells are both operating, they provide equal amounts of water to the population (Ref. 5).

Well Name	Percentage of Supply	Associated Population	Reference
Well 4	50%	575 * 0.5 = 287.5	Ref. 5; Ref. 51, p. 15
Well 5	50%	575 * 0.5 = 287.5	Ref. 5; Ref. 51, p. 15

Private Water Wells

In addition to the municipal water systems, a portion of the population within the Target Distance Limit from the site obtains drinking water from private wells. There are at least 188 active private wells serving approximately 487 people currently drawing from the Mason Valley Alluvial Aquifer located within the Target Distance Limit from the site (Figure 12; Ref. 27; Ref. 30; Ref. 40, pp. 10-12, 16-23, 54). The number of active private drinking water wells was calculated by excluding public, irrigation and inactive wells, as well as wells greater than 4 miles from the site, from the 208 wells included in the ARC DWMP (Ref. 5; Ref. 40, pp. 10-12). The population drinking from these wells was calculated by multiplying the number of wells by the 2009-2013 census figure of 2.59 persons per household (Ref. 27).

Since March 2004, ARC has provided bottled water to many of the residents with private domestic wells located downgradient of the Anaconda property. Eligibility for domestic well owners to be included in the Bottled Water Program is based on a uranium concentration of 25 µg/L (Ref. 40, pp. 6, 28, 32-43). Private wells included in the bottled water program are indicated in the table below.

Distance Category (miles)	**Public and Private Wells**	**Population Served**	**Reference**	**Distance-Weighted Population Value (Ref. 1, Table 3-12)**
0 to -¼	**Total**	**418.55**		**522**
	Weed Heights TAC	400	Figure 12; Ref. 10 (see apportionment calculation above)	
	DW-51	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-54*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-78*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-126	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-131	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	WDW017	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	WDW018*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
> ¼ to ½	**Total**	**68.9**		**33**
	DW-38*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-39	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-47*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-49	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-59	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-64*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	

Distance Category (miles)	Public and Private Wells	Population Served	Reference	Distance-Weighted Population Value (Ref. 1, Table 3-12)
	DW-74	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-75*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-76	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-77*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-91	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-100	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-102	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-116	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-123*	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-124	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-125*	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-128*	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-129*	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-132	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-141	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-143	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-144	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-145	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-148*	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-210*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
> ½ to 1	**Total**	**1,288.85**		**523**
	Mountain View Well (Yerington)	1,250	Figure 12; Ref. 8 (see apportionment calculation above)	
	DW-1	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-15*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-72*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-73*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-101	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-113	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-115	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-127*	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-134*	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-135*	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-149	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-150	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-151	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-173	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-202	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
> 1 to 2	**Total**	**3,153.82**		**939**

Distance Category (miles)	Public and Private Wells	Population Served	Reference	Distance-Weighted Population Value (Ref. 1, Table 3-12)
	Broadway Well (Yerington)	1,250	Figure 12; Ref. 8 (see apportionment calculation above)	
	California Well (Yerington)	1,250	Figure 12; Ref. 8 (see apportionment calculation above)	
	Weed Heights BLM 339	400	Figure 12; Ref. 10 (see apportionment calculation above)	
	DW-2*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-3*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-4*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-5*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-6*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-7*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-9*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-10*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-11	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-13*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-14*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-16*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-18	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-19*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-20	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-21	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-22*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-23*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-24*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-25*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-26*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-27*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-28*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-29*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-30*	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-31	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-32	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-33	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-34*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-35	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-36*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-37	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-40*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-41*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	

Distance Category (miles)	Public and Private Wells	Population Served	Reference	Distance-Weighted Population Value (Ref. 1, Table 3-12)
	DW-42*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-43*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-44*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-45*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-46*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-50*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-53*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-58*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-62*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-66	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-67	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-68	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-70*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-71	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-83	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-85*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-86*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-87*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-88*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-89*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-90*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-92*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-93	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-94*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-95	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-96*	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-97	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-98	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-99	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-103	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-104*	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-105*	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-106	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-107	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-110	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-112*	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-117*	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-120*	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-122*	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	

Distance Category (miles)	Public and Private Wells	Population Served	Reference	Distance-Weighted Population Value (Ref. 1, Table 3-12)
	DW-133	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-138	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-139*	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-140	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-147	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-152	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-153*	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-154*	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-155	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-156	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-157*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-159*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-160*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-161*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-162*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-164*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-165	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-166	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-167	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-168*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-169	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-183	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-186*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-187	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-198	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
> 2 to 3	**Total**	**1,887.16**		**212**
	Mason Road Well	1,250	Figure 12; Ref. 8	
	Well 4*	287.5	Figure 12; Ref. 5; Ref. 51, p. 15	
	Well 5	287.5	Figure 12; Ref. 5; Ref. 51, p. 15	
	DW-12	2.59	Figure 12; Ref. 27; Ref. 40, p. 16	
	DW-57*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-65	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-108*	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-114	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-118	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-119*	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-130*	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-136*	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	
	DW-146	2.59	Figure 12; Ref. 27; Ref. 40, p. 20	

Distance Category (miles)	Public and Private Wells	Population Served	Reference	Distance-Weighted Population Value (Ref. 1, Table 3-12)
	DW-170	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-172	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-178*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-181*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-184*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-188	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-189	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-190	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-191	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-193*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-194*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-195*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-196*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-199*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
> 3 to 4	**Total**	**46.62**		**4**
	DW-55*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-61*	2.59	Figure 12; Ref. 27; Ref. 40, p. 17	
	DW-80*	2.59	Figure 12; Ref. 27; Ref. 40, p. 18	
	DW-109*	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-121*	2.59	Figure 12; Ref. 27; Ref. 40, p. 19	
	DW-171	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-175*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-176*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-185*	2.59	Figure 12; Ref. 27; Ref. 40, p. 21	
	DW-192	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-197*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-201*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-203*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-204*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-205*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-206*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-207*	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
	DW-209	2.59	Figure 12; Ref. 27; Ref. 40, p. 22	
			Sum of Distance-Weighted Population Values:	**2,233**

*: On Bottled Water Distribution List (Ref. 40, pp. 38-43)

Sum of Distance-Weighted Population Values: 2,233
Sum of Distance-Weighted Population Values/10: 223.3

Potential Contamination Factor Value: 223.3

3.3.3 RESOURCES

Ground water from irrigation wells screened within the deep zone of the Mason Valley Alluvial Aquifer within 4 miles of the site is used for irrigation of commercial crops, including alfalfa, grain, and onions (Ref. 3; Ref. 16, pp. 11, 20-22, 52-54, 166, 172, 190-191, 197-201; Ref. 23, pp. 23, 60; Ref. 41, pp. 7, 22, 70, 118, 541; Ref. 42, p. 4; Ref. 46, pp. 12-13). In 2013, 10,593 acres of irrigated fields were measured within 4 miles of Anaconda site sources (Ref. 16, pp. 20, 52-54) (see Figure 15).

Resources Factor Value: 5