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FINAL

BASELINE ECOLOGICAL RISK ASSESSMENT WORK PLAN FOR OPERABLE UNIT 2 OF THE COLORADO SMELTER SITE LOCATED IN PUEBLO, COLORADO

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List of Acronyms

°F	degrees Fahrenheit
<	less than
>	greater than
%	percent
µg	micrograms
µg/L	microgram per liter
µm	micrometers
ASARCO	American Smelting and Refining Company
BERA	Baseline Ecological Risk Assessment
bgs	below ground surface
BNSF	Burlington Northern and Santa Fe
CCR	Code of Colorado Regulations
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CF&I	Colorado Fuel and Iron
CLP	Contract Laboratory Program
COPC	contaminant of potential concern
COPEC	contaminants of potential ecological concern
Cr (VI)	hexavalent chromium
CRC	collision reaction cell
CSM	conceptual site model
CTR	critical tissue residue
CVAA	cold vapor atomic adsorption
DO	dissolved oxygen
DSV	discharger-specific variance
DU	decision units
E. coli	*Escherichia coli*
ECOS	Environmental Conservation Online System

ERA	Ecological Risk Assessment
ERED	Environmental Residue-Effects Database
ESV	Ecological Screening Value
FASL	feet above sea level
HQ	hazard quotient
ICP	inductively coupled plasma
ICP-MS	inductively coupled plasma-mass spectrometry
IPaC	Information for Planning and Consultation system
LANL	Los Alamos National Laboratory
LD50	lethal dose 50%
LOAEL	lowest observed adverse effect level
LOEC	lowest observed effect concentration
MDL	Method Detection Limit
mg	milligrams
mg/kg	milligrams per kilogram
mg/L	milligram per liter
mL	milliliter
mm	millimeters
NLC	Newton Lumber Company
NOAEL	no observed adverse effect level
NPL	National Priorities List
QAPP	Quality Assurance Project Plan
ORNL	Oak Ridge National Laboratory
ORP	oxidation reduction potential
OU	Operational Unit
PAH	polycyclic aromatic hydrocarbon
PEC	probable effect concentration
pH	potential of hydrogen
ppm	parts per million

PWT	Pacific Western Technologies
PWTP	Pueblo Wastewater Treatment Plant
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROW	right-of-way
SIM	selective ion monitoring
SLERA	Screening Level Ecological Risk Assessment
SMDP	Scientific-Management Decision Point
SSL	Soil Screening Level
SVOC	semi volatile organic compound
SWA	State Wildlife Area
TCEQ	Texas Commission on Environmental Quality
TEC	threshold effect concentration
TMDL	total maximum daily load
TRV	toxicity reference value
TVS	Table Value Standards
UCL	upper confidence level
UFP-QAPP	Uniform Federal Policy Quality Assurance Project Plan
UPRR	Union Pacific Railroad
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
XRF	X-ray fluorescence

1.0 Introduction

1.1 Purpose and Objectives

This document is a Baseline Ecological Risk Assessment (BERA) Work Plan for Operable Unit 2 (OU2) at the Colorado Smelter Site located in Pueblo, Colorado (Figure 1). A Screening Level Ecological Risk Assessment (SLERA) was finalized in July 2024 (USEPA/OTIE/PWT, 2024) and defined contaminants of potential ecological concern (COPECs) in soils, surface water, pore water, and sediments from areas with ecological attributes. Since a SLERA specific to Operable Unit 1 (OU1) was not completed, areas within OU1 that contain suitable habitat to support ecological receptors are considered in this BERA Work Plan. The ecological areas within OU1 include urban parks presenting terrestrial habitats and aquatic habitats in the Arkansas River and Runyon/Fountain Lakes State Wildlife Area (SWA) ("the Site"; Figure 1). There are also aquatic habitat areas associated with streams and ravines both east and west of the OU2 former smelter boundary (Figure 1).

The analytical media data evaluated in the SLERA, along with biota data collected in 2023, are used to refine the conceptual site exposure model described in the SLERA and provide a basis for the United States Environmental Protection Agency (USEPA) to perform a BERA for ecological resources associated with the Site.

1.2 Overview of the Eight-Step Ecological Risk Assessment Process

The USEPA has developed specific methods and procedures for completing ecological risk assessments (ERAs) (USEPA 1992; 1997; 1998; 2001). Figure 2 shows the eight-step process that is recommended for ERAs completed at Superfund sites under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The eight steps shown in Figure 2 are not intended to represent a linear sequence of mandatory tasks. Rather, some tasks may proceed in parallel, some tasks may be performed in a phased or iterative fashion, and some tasks may be judged to be unnecessary at certain sites. This document is intended to address Steps 3 and 4 of the ERA process presented in Figure 2.

1.3 Document Organization

This BERA Work Plan is organized into the following sections:

Section 2. Site Background and Data Review – This section summarizes the operational history of the Site. The Site overview includes the environmental setting, describes the soil decision units (DUs) and investigation areas evaluated in the SLERA. This section also describes the data sets evaluated in the SLERA; abiotic sample data not assessed in the SLERA and summarizes the biota data that will be incorporated into this BERA.

Section 3. Methodology for Refinement of Constituents of Potential Ecological Concern – The initial list of contaminants investigated in Steps 1 and 2 included all contaminants identified or suspected at the Site. Because of the conservative assumptions used during the risk screen, some of the contaminants retained for Step 3 might pose negligible risk. This section provides the methodology for critically evaluating the COPECs by media and exposure area as defined in Step 2 and if the contaminant should remain as a BERA COPEC or if justification is sufficient for removal.

Section 4. Conceptual Site Model (CSM) – In this section, the complete exposure pathways defined in the SLERA are revisited and refined through evaluation of the exposure pathways and the ecosystems at the Site. This section also defines the ecological exposure areas to be evaluated in the BERA.

Section 5. Assessment and Measurement Endpoints – The assessment endpoints are critical elements in the design of the BERA. This section presents the refinement of the assessment endpoints listed in the SLERA. This section also defines the measurement endpoints and describes the relationship between measurement and assessment endpoints.

Section 6. Risk Analysis Plan – The Risk Analysis Plan specifies the methods by which the collected data will be analyzed for determination of potential ecological risk. This section includes the food-chain-exposure-model parameters, data reduction techniques, data interpretation methods and statistical analyses to be used in the BERA. The risk analysis section also includes a discussion of the toxicity reference values to be used in the BERA.

Section 7. BERA Risk Characterization – This section brings together the exposure and the toxicity to estimate the potential risk to the receptors.

Section 8. Uncertainty Analysis – This section describes the major uncertainties identified during development of this BERA Work Plan with an emphasis on those issues that risk managers should consider in making risk management decisions. The Uncertainty Analysis presented in the BERA will be an expanded version of what is presented in this Work Plan.

Section 9. **References** – Citations for all documents referred to in the text and the text tables.

All figures and appendices cited in the text are provided at the end of the report. Smaller tables are incorporated within the text and the larger media screening tables are presented at the end of the report. Appendix A summarizes the soil, sediment, and pore water data. Appendix B summarizes the 2023 biota data. Appendix C presents revised COPEC screening for surface water, pore water, and sediment data because these media were sampled after the SLERA was finalized. Note that the screening of surface water, sediment and pore water are organized by onsite (e.g., ravines) and off-site (e.g., Arkansas River and Runyon Lake).

2.0 Site Background and Data Review

2.1 Site Overview

Detailed Site background and characteristics are provided in this section. The Site's environmental setting is also described along with a summary of the available analytical data.

2.1.1 Site Location

The Colorado Smelter Superfund Site is comprised of two OUs (Figure 1). The former smelter (OU2) is located entirely within the boundaries of OU1, the community properties study area which includes residential and commercial properties surrounding the location of the former smelter. The City of Pueblo is northwest of historical smelter operations above the confluence of the Arkansas River and Fountain Creek. The area surrounding Pueblo sits at the western edge of the Great Plains and is characterized by rolling plains of semi-arid desert, with an elevation between 4,692 and 4,750 feet. Pueblo County transitions from high plains in the east to the Rocky Mountains in the west.

2.1.2 Site History and Historical Smelter Operations

Five smelters operated in Pueblo between 1878 and 1921. The Pueblo, Massachusetts, Blende, Philadelphia, and Colorado Smelters operated in the area for varying lengths of time (Figure 1). The smelters processed ores to recover gold, silver, copper, zinc, and lead.

The Colorado Smelting and Refining Company, (Boston and Colorado Smelting Works, or the Eilers Smelter) established the Colorado Smelter at the southern terminus of Santa Fe Avenue south of the Arkansas River, just north of the Colorado Fuel and Iron (CF&I) steel mill in 1883. The plant primarily smelted gold, lead, and silver ore that had been mined from the Madonna Mine in Monarch, Colorado and some of the mines in Leadville, Colorado. The state-of-the-art smelter began operations in 1883 with four roasters each capable of processing 100 tons of ore per day. In 1889, the facility was expanded to five roasters. The Colorado Smelter merged with the Pueblo Smelter and other smelters as the American Smelting and Refining Company (ASARCO) in 1899. In 1901, a sixth roaster was added, a 200-foot-tall smelter stack was built, and the facility could process up to 600 tons of ore per day. The smelter operated for 25 years and closed in 1908. Most of the historical smelter structures were torn down in 1909 except for the 200-foot-high stack, the 110-foot-high stack, and the ore sampling mill present in 1921. Figure 3 shows the approximate location of the Colorado Smelter buildings and facilities based on the 1905 Sanborn Map Company fire insurance map (Sanborn, 1905).

The Great Pueblo Flood of June 1921 damaged the infrastructure of the Pueblo area. The Pueblo City-County Library (PCCLD) digital collection has an aerial view of 1921 flood that shows the 200-foot-high stack, the 110-foot-high stack, and the ore sampling mill still present on the Site in June of that year (PCCLD, 2025). Photographs from 1921-1924 also show massive slag piles present within what is now the current OU2 ravine with no indication of vegetation or presence of a stream (PCCLD, 2025). The PCCLD digital collection shows the construction of the new Arkansas River channel, the levee, the new Santa Fe Avenue bridge, and the Denver and Rio Grande Western Railroad (D&RGW) bridge from 1921-1924. The D&RGW became the Union Pacific Railroad (UPRR) in 1988 and operates the rail line on the west side of OU2.

Following the flood, ASARCO sold a portion of the Colorado Smelter property to Newton Lumber Company (NLC) in 1921. NLC operated at the location until the 1960s. In 1922, a portion that included the supervisor's residence, barn, and the 200-foot-high smelter's smokestack was sold to St. Mary Help of Christians. In 1923, the 200-foot-high smokestack was demolished, and bricks were used to construct St. Mary's School on Mesa Avenue. The supervisor's residence was converted into a rectory that is still in use today (Historitecture, 2014). Interstate 25 (I-25) through Pueblo, including the bridge over the Arkansas River, was constructed from 1949 to July 1, 1959 (PCCLD, 2025). After the 1960s, the NLC portion of the Site was sold to individuals and small to medium-sized companies.

In 1989, a 2-3 gallon per minute liquid discharge coming from a concrete pipe under the Santa Fe Avenue bridge was noted by a pedestrian. An orange discoloration was also noted across a bike path directly over a culvert that goes under the bike path and into the Arkansas River. Pueblo County Health Department was notified. The Water Quality Control Division of the Colorado Department of Public Health and Environment (CDPHE) and the Pueblo Wastewater Treatment Plant (PWTP) were subsequently notified. A grab sample of the liquid was collected by PWTP for analysis. The sample contained elevated concentrations of iron and zinc. After being contacted, CF&I suggested that the Colorado Smelter waste slag pile was the source of elevated iron and zinc. A CDPHE investigation confirmed that an intermittent seep was draining the slag waste into the culvert and then into the Arkansas River.

CDPHE contractors collected Site data in 1994 and 1995, which identified elevated lead and arsenic concentrations in surface soil within OU2. Subsequent field investigations found smelter slag piles at OU2, prompting investigation of adjacent residential areas (i.e., OU1). The USEPA and the CDPHE began investigating residential yards near Colorado Smelter in 2011 following a Preliminary Assessment prepared by USEPA in 2008, to determine if base metal residues from past smelting operations posed a potential threat to the health of residents. The investigation showed that lead and arsenic were the contaminants of concern and sampling results found elevated lead and arsenic concentrations in some residential yards and at the Site.

The site was placed into the Comprehensive Environmental Response, Compensation, and Liability Information System as the Santa Fe [Bridge] Culvert site (COD982572513) in 1990 (CDPHE, 1995) and listed on the National Priorities List (NPL) in December 2014 (CON000802700).

2.1.3 Operable Unit 1 (OU1)

OU1 has an area with a perimeter of 5.17 miles and the area of potential ecological concern for OU1 has a perimeter of 4.63 miles (Figure 1). OU1 has a convoluted border (Figure 1) that includes numerous roads, as well as Bessemer Park to the west, and the Arkansas River, Runyon Lake, and Runyon Field, to the north. Other urban parks include Moynihan Park and Stauter Field. OU1 includes approximately 3,400 linear feet of the Arkansas River on the west from just upstream of the UPRR railroad bridge downstream to the Burlington Northern and Santa Fe (BNSF) railroad bridge to the east. The western river section is approximately 80 to 250 feet wide with several gravel bar islands, a 20-foot-high concrete levee and walking path west of the Santa Fe Avenue bridge, and to the east includes wetlands and seasonal riparian areas.

The westernmost boundary of OU1 is roughly 8.5 miles below the Pueblo Reservoir. Multiple discharge conduits from the reservoir release water into the Arkansas River and control flow in the primary

channel. Wildhorse Creek, an effluent-dominated creek, flows south into the Arkansas River about 1.75 miles west of the boundary of OU1. Wildhorse Creek flow originates primarily from the Pueblo West wastewater treatment facility. It currently has a Total Maximum Daily Load (TMDL) for *Escherichia coli* (*E. coli*) (COARMA04a).

The Arkansas River flows eastward from Pueblo Reservoir past the confluence with Wildhorse Creek, then through a series of riprap structures to generate whitewater for the Whitewater Park, then through OU1, past the northern edge of OU2, under the Moffat Street pedestrian bridge and the low head dam, then out of OU1 south of Fountain Lake and the BNSF railroad bridge, and continues east past the confluence with Fountain Creek (Figure 1). The entire section from Wildhorse Creek to Fountain Creek (COARMA03) is currently not attaining water quality standards for selenium, arsenic, *E. coli*, and sulfate. Fountain Creek, a perennial sandy-bottom, warm-water creek, flows into the Arkansas River approximately 800 feet below the easternmost boundary of OU1. Undeveloped Areas of OU1 are considered for ecological receptors under OU2.

OU1 includes more than 2,000 residential homes, of which approximately 50 percent (%) are rental units (Pacific Western Technologies [PWT] 2020c). A significant majority of the homes in Eilers and Bessemer neighborhoods were constructed during the years of 1887 to 1909 (DeHerrera et al., 2011).

2.1.4 Operable Unit 2 (OU2)

The former smelter (OU2) includes approximately 45.5 acres with a perimeter of 1.58 miles. It is bounded by South Santa Fe Avenue to the east, the Arkansas River to the north, Interstate 25 (I-25) and the UPRR to the west, and East Mesa Avenue to the south. Benedict Park is a small 2.28-acre City of Pueblo owned park located in the southwest corner of OU2 (Figure 1).

OU2 is situated at an approximate average of 4,710 feet above sea level (FASL). The elevation is highest in the south and southeast portions of the Site (approximately 4,761 FASL). The Site grades down in elevation from south to north and reaches a low at the Arkansas River (approximately 4,645 FASL). Topography varies east of the UPRR, within the Site where a moderate depth ravine grades into a flat marshy area and then into a flat lying commercial area.

OU2 borders approximately 370 linear feet of the Arkansas River from the I-25 bridge downstream to the South Santa Fe Avenue bridge. This section of the river is approximately 190 feet wide, has a limited amount of seasonal riparian areas and islands, and is flanked by a 20-foot-high concrete levee and walking path on the south and north sides. Annual average in-stream temperatures are expected to be like those near the Moffat Street pedestrian bridge, 450 to 811 feet downstream (32 to 82 degrees Fahrenheit [°F]).

Almost 17.9 acres (1.38-mile perimeter) of OU2 are undeveloped, consisting of forest, grassland, and bare ground. Benedict Park, an additional 2.2 acres in the southwest corner of OU2, is covered by manicured grasses. Together, these comprise 44.1% of the total area of OU2. Areas bordering the railroad tracks to the west in OU2 are topographically irregular and include ravine and lower lying collection areas.

Seven irregularly bordered slag piles, some 20 to 30 feet high, have been identified in the OU2 ravine, and a preliminary slag pile investigation map is presented in Figure 4. The two southernmost slag piles are bisected by a social trail (PWT, 2018). Figure 4 also shows analytical results for lead and arsenic from

grab samples collected from the surface of the slag piles. A perennial stream flows through these piles and through a storm drain culvert into the Arkansas River (Figures 1 and 5).

Commercial properties and developed lots (i.e., driveways, parking lots, bare spaces) occupy the remainder of OU2. Some entities include St. Mary's Catholic church, Greentech Renewables (electrical supply store), Driven Plastics, the former Ryder Truck Rental and maintenance shops, Chem Way, Inc. (lawn care), Domenic and Sons Paint and Body, Ferguson Plumbing Supply, Ace Enterprises, Inc., and Top Notch Trailers in Pueblo (PWT, 2018; Google search).

2.2 Environmental Setting

2.2.1 Hydrology

Pueblo lies within the Arkansas River drainage basin and the Middle Arkansas River Subbasin. It sits at the confluence of three separate drainage basins including the Upper Arkansas River Subbasin, the Middle Arkansas River Subbasin, and the Fountain Creek Subbasin. The 2020 Colorado Segmentation Guide (CDPHE, 2023) identifies a portion of the Arkansas River that flows through OU1 as COARM03_A, and portions of Runyon/Fountain Lakes and Valco Ponds as COARMA_28. COARM03_A is currently on the Colorado 303d list of impaired or threatened waters for selenium (dissolved, site-specific chronic standard of 17.1 micrograms per liter [µg/L], aquatic life use), arsenic (total, 0.02 µg/L standard, water supply use), and *E. coli* (126 per 100 milliliters [mL], recreational use). Sulfate is also elevated slightly in this segment (>250 mg/L) in one of three locations. The City of Pueblo has a discharge-specific variance (DSV) for selenium and sulfate. Infiltration and basement sump pump discharge into the sanitary sewer system are thought to contribute to elevated background levels of selenium in the sewer influent. Pueblo has undertaken extensive pipeline renovation to mitigate this infiltration and inflow issue.

Aquatic areas include a perennial stream that passes through the ravine of OU2, the Arkansas River channel to the north of OU2, four similar ravines with small streams are present in OU1, three to the east and one to the west of OU2, and the Runyon/Fountain Lakes SWA (Figure 1). Initial surface water, pore water, and sediment sampling focused on the OU2 Former Smelter Area and Undeveloped Areas of OU1 are summarized in Colorado Smelter OU2 Surface Water, Pore Water, and Sediment Data Summary (PWT, 2023). Additional surface water, sediment, and pore water data collected in 2023 and May 2025 are included in this BERA Workplan. Surface water, pore water, and sediment sampling locations are shown on Figure 5 along with the surface water drainage features. Additional surface water, sediment, and pore water data to be collected in the latter half of 2025 and early 2026 will be evaluated and provided under separate covers.

The stream in the OU2 ravine originates from discharge from a storm drain at the east end of West Arroyo Avenue, under I-25, into the Site and flows north along the base of the ravine, passes under or through slag piles in OU2, and then collected at a storm drain culvert located at the southeast corner of parcel 1501135002, 771 South Santa Fe Avenue (Figure 5). This storm drain goes under South Santa Fe Avenue and enters the Arkansas River east of Santa Fe Avenue and west (upstream) of the pedestrian bridge that crosses the Arkansas River on the Arkansas River Trail (PWT, 2023). The U.S. Geological Survey (USGS) gauging station 7099970 is located at the point of discharge. Stream flows are expected to oscillate in water courses with local rain as well as spring snow melt.

Channelization of the Arkansas River and construction of the levee and South Santa Fe Avenue bridge at the northern border of OU2 occurred from 1922-1924 (PCCLD, 2025). Construction of the I-25 bridge across the Arkansas River occurred between 1949-1959, as well as slag removal and artificial fill placement in the northern area of OU2 (PCCLD, 2025. These construction activities changed river and Site hydrodynamics substantially. Runyon Lake and Fountain Lake were both created by sand and gravel operations in the early 1950s (Colorado Geological Survey, 1974).

2.2.2 Climate and Meteorology

The area's long-term temperature/precipitation averages range from 30.8°F/0.34 inches (January) to 74.1°F/2.01 inches (July). Total annual precipitation averages around 12 inches, mostly from sporadic summer thunderstorms. Tracks of thunderstorms between the South Platte and Arkansas rivers have produced up to 24 inches of rain in 12 hours. Prior to the construction of flood control measures in 1922-1924, heavy sporadic rainfall across the drainage basin resulted in water volumes that exceeded stream channel carrying capacity.

A decadal wind rose generated for the Pueblo area (January 1, 2008, to December 31, 2018) demonstrates that prevailing winds are primarily from west to east. Overall, average wind speeds range from 8.0 to 12.9 miles per hour with the highest average wind speeds arising from the north and north-northeast. Other reports suggest prevailing winds are from the northwest and average 7.6 miles per hour (McVehil-Monnett Associates, 2019).

2.2.3 Habitats and Biological Communities

2.2.3.1 OU1

Several habitat types are within the OU1 site and were considered in the screening-level problem formulation: aquatic (in-stream), wetland, riparian, and upland. Aquatic areas include the Arkansas River, Runyon Lake, Fountain Lake, the perennial stream in the OU2 ravine, and the four perennial and intermittent streams in the ravines outside of OU2 (Figures 1 and 5). Aquatic areas also include channelized portions of the Arkansas River. In these areas, concrete flood control levees have channelized river flow, resulting in hydrodynamics more typical of steep elevation water courses.

Aquatic ecological receptors (aquatic plants, macroinvertebrates, and fish) are thought to use aquatic, wetland, and riparian habitats. Terrestrial receptors that are dependent on aquatic environments (piscivorous birds, mammals, amphibians, reptiles, etc.) also use these habitats. Other terrestrial receptors (plants, soil invertebrates, terrestrial birds, mammals, reptiles) use the riparian, and upland habitats.

2.2.3.2 OU2

Several habitat types are within OU2: aquatic (in-stream), wetland, riparian, and upland. A wetland area is located within the ravine, it has been estimated to be 1.06-acre in size and has a Jurisdictional Wetland Determination (Appendix D, CDOT and FHWA, 2013). The wetland is fed by a City of Pueblo surface water storm drainage.

Aquatic ecological receptors (aquatic plants, macro-invertebrates, and fish) use the aquatic, wetland, and riparian habitats. Terrestrial receptors that are dependent on aquatic environments (piscivorous birds, mammals, amphibians, reptiles, etc.) also use these habitats for foraging, resting, and potentially

nesting. Other terrestrial receptors (plants, soil invertebrates, terrestrial birds, mammals, reptiles) use the riparian, and upland habitats. Mule deer, red fox, wild turkey, and other small mammals and songbirds inhabit the ravine area. Waterfowl may utilize the wetlands as well as the Arkansas River and Runyon/Fountain Lake SWA areas north of OU2 (PWT, 2018).

2.3 Data Representing Ecological Exposures

Field and analytical data from the OU1 and OU2 Remedial Investigations (RI) were collected in accordance with their project-specific Uniform Federal Policy Quality Assurance Project Plans (QAPP) (PWT, 2015b; 2016; 2017e; 2017f; 2018a; 2018b; 2019c; 2021; 2020d; 2022b; 2022c; 2023c; 2023d; 2024; 2025a) and have been uploaded into project-specific USEPA Scribe Databases per the Colorado Smelter Data Management Plan (PWT, 2023a; 2025b). Appendix A of this BERA Work Plan presents a summary of the abiotic sample data collected to date and includes surface soil, surface water, pore water and sediment data collected since finalization of the SLERA. Appendix B presents a summary of the biota data collected to support the BERA. Appendix C presents a screening of the surface water, pore water and sediment data.

2.3.1 Surface Water Data

Surface water, pore water, and sediment sampling focused on the OU2 Former Smelter Area and Undeveloped Areas of OU1. To meet the surface water quality criteria of the middle Arkansas River (CDPHE, 2021b), very low analytical method detection limits for arsenic, cadmium, mercury, and silver were required. The surface water data are from the 2019 OU2 investigations (PWT, 2023b) from 21 locations sampled quarterly (total of 84 samples) and the 2023 surface water investigation from 12 Runyon/Fountain Lakes locations, four locations along the Arkansas River (SW008, SW011, SW017, SW022), and three locations in OU2 (SW005, SW006, SW007) for a total of 19 samples (Figure 5) (PWT, 2022c; 2023d). In May 2025, a surface water investigation was conducted as a result of the City of Pueblo enforcement action within OU2 with samples collected from three locations along the Arkansas River (SW009, SW011, and SW017), and seven locations within the ravine of OU2 (SW005, SW006, SW007, SW012, SW016, SW015, and SW019) for a total of 10 samples (Figure 5) (PWT, 2025a).

A total of 113 surface water samples were analyzed for:

- ICP-MS metals (total) via USEPA Method 1638 Modified and by ICP-MS metals (total) via USEPA Method 6020B per CLP SOW SFAM02.0. Total includes hardness by calcium and magnesium calculation.
- ICP-MS metals (dissolved) via USEPA Method 1638 Modified with in-bottle digestion and by ICP-MS metals (dissolved) via USEPA Method 6020B per CLP SOW SFAM02.0. 11 samples.
- Mercury (total and dissolved) via USEPA Method 1631E using clean-hands, dirty-hands sampling protocol (USEPA, 2001) and by USEPA Method 7470A per CLP SOW SFAM02.0.
- VOCs via USEPA CLP gas chromatography-mass spectroscopy (GC-MS) analysis using USEPA Method 8260B, under CLP contract SOM 02.4 and SFAM02.0.
- Semi volatile organic compounds (SVOCs) via USEPA CLP GC-MS analysis using USEPA Method 8270D with SIM for PAHs, under CLP contract SOM 02.4 and SFAM02.0.
- Inorganic anions, chloride, sulfate as SO4, and fluoride, by ESAT under Technical Direction A-202 using USEPA Method 300.1

Surface water detection limits for arsenic, cadmium, mercury, and silver were required to be low enough to meet Code of Colorado Regulations (CCR) 5 CCR 1002-31 and 5 CCR 1002-32 standards.

Field parameters measured during sample collection included potential of hydrogen (pH), dissolved oxygen (DO), oxidation reduction potential (ORP), temperature, specific conductivity, turbidity, and color. Further details are found in the OU2 QAPP (PWT, 2023d) and Data Summary Report (PWT, 2023b).

Aluminum, cadmium, chromium, copper, lead, manganese, nickel, silver, and zinc concentrations were screened using hardness dependent benchmarks as defined by 5 CCR 1002-32, Table Value Standards (TVS). Surface water sampling locations were broken out between onsite ravines, which have an average hardness of 1,279 mg/L; however, the maximum default value is 400 mg/L, and Arkansas River and Runyon Lake used an average hardness of 200 mg/L. Note that the calculation for aluminum uses a hardness no greater than 220 mg/L.

2.3.2 Pore Water Data

The pore water sample data are from the 2019 OU2 investigation (PWT, 2023b) from 19 planned locations with 12 samples collected and from the 2023 Runyon/Fountain Lakes pore water sampling from 14 planned locations with 11 samples collected (Figure 5) (PWT, 2022c; 2023d; PWT, 2025a). In addition, a May 2025 pore water investigation was conducted as a result of the City of Pueblo enforcement action within the ravine of OU2 at five locations (SW005, SW006, SW007, SW012, and SW016) for a total of six samples (Figure 5). Pore water sampling locations that were planned and not sampled were due to tight clay conditions that prevented sample collection. The BERA pore water data set consists of a total of 34 samples[1] analyzed for the same methods as described above for surface water samples. Field parameters measured during sample collection included pH, DO, ORP, temperature, specific conductivity, turbidity, and color.

2.3.3 Sediment Data

The sediment sample data are from the 2019 OU2 investigation (PWT, 2023b) from 19 locations with 32 samples collected and from the 2023 Runyon/Fountain Lakes pore water sampling from 13 locations with 13 samples collected (Figure 5) (PWT, 2022c; 2023d; 2025a). In addition, a May 2025 sediment investigation was conducted as a result of the City of Pueblo enforcement action within the ravine of OU2 at five locations (SW005, SW006, SW007, SW012, and SW016) for a total of six samples (Figure 5). Sediment samples were collected from 0-6 inches and 6-12 inches with 32 samples collected from the 0–6-inch interval and 13 samples collected from the 6–12-inch interval. Sediment samples that were not collected from the 6–12-inch interval was due to cobbles, slag, or tight clay conditions that prevent sample recovery. The BERA sediment data set consists of a total of 45 samples analyzed for:

- ICP-MS metals via USEPA Method 6020B per CLP SOW ISM 02.4 and SFAM02.0.
- Mercury via USEPA Method 7471B per CLP SOW ISM 02.4 and SFAM02.0.
- VOCs via USEPA CLP GC-MS analysis using USEPA Method 5035A/8260B, under CLP contract SOM 02.4 and SFAM02.0.
- SVOCs via USEPA CLP GC-MS analysis using USEPA Method 8270D with SIM for PAHs, under CLP contract SOM 02.4 and SFAM02.0.

[1] Field duplicate or triplicates are not included in total sample numbers.

2.3.4 Soil Data

Terrestrial exposures are represented by the soil data collected across OU2 and for specific areas in OU1. The bulk of the soil data considered is from the OU2 RI sampling, which includes the sampling of 39 half-acre DUs within the Former Smelter Area of OU2 and 89 one-acre DUs Undeveloped Areas in OU1 for a total of 128 Dus, as shown in Figure 6 (PWT, 2018b; 2022a; 2022c; 2023d; 2025a). Soil data sets outside the OU2 DU assessment include the UPRR right-of-way data (Figure 7) and the soil data from the six municipal parks located in OU1 (Figure 1). Appendix A presents summaries of the surficial soil data available for evaluation in the BERA. Figure 6 references EVRAZ Solid Waste Management Unit (SWMU) 8. The SWMU No. 8 is controlled by EVRAZ Rocky Mountain Steel Environmental Covenant under supervision of the CDPHE (RCRA Permit #CO-05-09-29-01 for SWMUs 8, 23, 35, 36, 37, 38, 39, 68, 77, 79; USEPA ID#COD 007057961) (CDPHE, 2013), and this area was not sampled to support the risk assessments.

2.3.4.1 OU2 Soil Data

Soil was sampled from 39 ½-acre DUs locations inside the Former Smelter Area of OU2 and 89 one-acre DUs Undeveloped Areas in OU1. Some of these DUs are located within and around the Runyon Lake/Fountain Lake SWA and the Arkansas River Figure 6 shows the locations of the DUs, and sub-area assignments based on areal use to determine Incremental Sampling Methodology (ISM) (ITRC, 2012) variability within OU2 developed for the surface soil pilot study (PWT, 2018b; 2019d). Sub-areas A, B, and C are ½-acre DUs within the former Smelter footprint, with sub-areas A and B representing the 30 DUs considered for the OU2 ravine and sub-area C representing the nine commercially developed DUs. Sub-areas D, E, F, and G are one-acre DUs representative of vacant and Undeveloped Areas. Sub-area D is comprised of ten DUs located along the Arkansas River and City of Pueblo storm drain west of I-25. Sub-area E is comprised of 14 DUs representative of the I-25 transportation corridor. Sub-area F is comprised of 45 DUs representative of the Runyon Lake/Fountain Lake SWA. Sub-area G is comprised of 20 DUs representative of Undeveloped Areas on the southeast portion of the Site.

OU2 soil sampling data were originally presented in the OU2 Surficial Soil Data Summary (PWT, 2022a) and updated with additional soil samples collected from DU-0124 and DU-0674. In addition, a May 2025 surface soil investigation was conducted as a result of the City of Pueblo enforcement action within the ravine of OU2 at 16 DUs (DU-0002, DU-0003, DU-0004, DU-0005, DU-0006, DU-0017, DU-0018, DU-0019, DU-0020, DU-0021, DU-0022, DU-0023, DU-0025, DU-0026, DU-0130, DU-0131) sampling the 0-1-inch and 1-6-inch intervals for a total of 36 samples (Figure 6). Samples were prepared and analyzed as described below for the shallow horizons (0-1 and 1-6 inches) with the exception that the analysis for hexavalent chromium Cr (VI) was dropped. To be more representative of current conditions the surficial soil data from the 0-1-inch and 1-6-inch sample intervals in these 16 DUs that were resampled replaced the previous data to be used in this BERA WP.

Incremental sampling was performed using ISM with a 30-point systematic grid with one sample collected from each of five horizons below ground surface (bgs):

- 0 to 1 inch
- 1 to 6 inches
- 6 to 12 inches
- 12 to 18 inches

- 18 to 24 inches

For shallow horizons (0-1 and 1-6 inches), soil samples were sieved with a #10 mesh (2mm opening), then sieved further using a #60 mesh (0.25mm opening), producing a fine fraction. Subsamples of samples collected between 2018 and 2020 were analyzed for target analytes (lead, arsenic, copper, manganese, and zinc) using XRF, and a 2-gram subsample was then analyzed for metals by USEPA Method 6020B via ICP-MS. After 2020, the 2-gram subsamples were sieved and analyzed in the same manner; however, XRF was not used to analyze surface soil samples (0-1 and 1-6 inches) (PWT, 2018b; 2020c; 2020d; 2022a; 2022c; 2023d).

Samples (not sieved) from all five depth horizons within the 39 half-acre DUs in the Former Smelter Area of OU2 were analyzed for:

- Mercury by USEPA method 7471B cold vapor atomic adsorption (CVAA).
- Hexavalent chromium Cr (VI) analysis via chromium speciation analysis using a modified USEPA Method 3060A extraction and subsequent analysis by ion chromatography coupled to an inductively coupled plasma collision reaction cell mass spectrometer (ICP-CRC-MS)
- SVOCs and PAH compounds using USEPA CLP GC-MS analysis by USEPA Method 8270D with SIM
- One discrete sample from each of the five horizons from the center of each DU was analyzed for VOCs using USEPA CLP GC-MS analysis by USEPA Method 5035A/8260B.

Soil samples collected from undeveloped 1-acre DUs outside of the Former Smelter Area were not analyzed for the following:

- Mercury
- Hexavalent chromium Cr (VI) speciation
- SVOCs/PAHs
- VOCs

Soil samples from the 0-1-inch and 1-6-inch depth intervals were analyzed by XRF and ICP-MS; the ICP-MS metals data was used for the SLERA (USEPA/OTIE/PWT, 2024). The ICP-MS data will be used for the BERA. A total of 576 soil samples were analyzed by ICP-MS Method 6020B for metals (16 target analytes), 173 samples from within OU2 were analyzed by CVAA Method 7471B for mercury, 176 samples from within OU2 for VOCs by GC-MS analysis by Method 5035A/8260B, and 175 samples from within OU2 for SVOCs by GC-MS analysis by Method 8270D with SIM via the USEPA's CLP Statement of Work for Inorganic Superfund Methods Multi-Media Multi-Concentration (ISM 02.4) (USEPA, 2016a) and CLP Statement of Work for Organic Superfund Methods Multi-Media Multi-Concentration (SOM 02.4) (USEPA, 2016b). A total of 172 samples from within OU2 for Cr VI analysis were analyzed by ICP-CRC-MS by BAL SOP No. BAL-4300.

2.3.4.2 UPRR Right-of-Way

In May of 2023, slag and soil in the UPRR right-of-way (ROW) were sampled (Jacobs, 2023). To support the ecological evaluation, 13 soil/slag samples were collected and analyzed for metals using methods SW6020B/ SW6010B, and SW7471A. Ecological sample locations focused on the presence of habitat on the east side of the southern end of the UPRR ROW with an approximate area of 8.5-acres (Figure 7). Samples for ecological evaluation were discrete (grab) samples from the top 0-2 inches of the ground

surface that were not sieved, but slag fines for sample collection were prioritized so that samples represent materials bioavailable to ecological organisms. The samples were then ground to less than 150-micron size by the analytical laboratory and then analyzed for metals by SW6010C (ICP/AES) and SW6020 (ICP/MS) and for mercury by SW7471A.

2.3.1.3 Municipal Parks in OU1

Most of the residential soil sampling data from the OU1 RI was not utilized for the OU2 SLERA analysis, including the OU1 park datasets. However, parks can provide suitable habitat for ecological receptors of concern. Municipal parks outside the former smelter footprint were sampled as part of the OU1 RI community studies area and will be incorporated to support the ERA. Figure 1 identifies five city-owned parks, one county-owned park, and one park owned by the school district. The municipal park areas include Stauter Field, Bessemer Park, Benedict Park, Little Chief Park, Moynihan Park, Bessemer Academy School Park, and Runyon Sports Complex, which are included in the dataset for this BERA.

In accordance with the OU1 QAPP (PWT, 2023c), park DUs were divided into five Dus, and each DU was sampled at four depths using the ISM 30-point incremental composite sampling (ICS) systematic grid with a random start approach. The average size of the 72 park DUs was 17,077 square feet. If an area identified for characterization was less than 5,000 ft^2, a 5-point composite sample approach was utilized. An exception was made for Little Chief Park with an area of 6,406 ft^2, which was sampled as a single DU using the 30-point ICS. Composite samples were collected at each of four depth intervals between ground surface and up to 18 inches (0-1 inch, 1-6 inch, 6-12 inch, and 12-18 inch).

For shallow horizons (0-1 and 1-6 inches), soil samples were sieved with a #10 mesh (2 mm opening), then sieved further using a #60 mesh (0.25 mm opening), producing a fine fraction. Subsamples of samples collected between 2015 and 2020 were analyzed for target analytes (lead, arsenic, copper, manganese, and zinc) using XRF, and select 2-gram subsamples were then analyzed for metals by USEPA Method 6020B via ICP-MS. After 2020, the 2-gram subsamples were sieved and analyzed in the same manner; however, XRF was not used to analyze surface soil samples (0-1 and 1-6 inches) at Little Chief Park, a small 6,406 ft^2 park, sampled in 2022, (PWT, 2016; 2017e; 2017f; 2018a; 2019c; 2020b; 2020c; 2021; 2022b; 2023c; 2025b).

Samples were prepared in a field laboratory, which including drying and sieving with 10 mesh (excludes material > 2 mm in diameter) and a 60 mesh (excludes material > 250 µm). The passing 60 mesh sample (<250 µm) was measured using a XRF unit (Niton XL3t 955 GOLD Ultra) with target analytes arsenic, lead, copper, manganese, and zinc. A subset of samples was subsampled for ICP-MS metals analysis by Method 6020b. Samples from Runyon Field also underwent analysis for SVOCs via method 8270D with SIM, VOCs via Method 5035A/8260B, and hexavalent chromium via Chromium Speciation Analysis (IC-ICP-MS).

Benedict Park was sampled for surficial soil as part of the OU1 RI in 2017 (PWT, 2017c). Elevated levels of arsenic and lead were observed in soil above the residential cleanup levels, 61 ppm for arsenic, 350 ppm for lead, established in the i-ROD (PWT, 2017c). Two playground areas were remediated to a depth of 24 inches by USEPA (PWT, 2020c). In May 2025 surface soil resampling of the 0-1-inch and 1-6-inch intervals in DUs A and D were conducted as a result of the City of Pueblo enforcement action and the recent ICP-MS result data will be used in this BERA WP.

Soil sampling was performed at several other city parks including Moynihan, Bessemer, Stauter, Little Chief Park, and Bessemer School Park. It was determined that cleanup was not needed at these sites (PWT, 2019b; 2020c). Soil sampling was conducted at Runyon Field Sports Complex, a county-owned baseball park in 2018, and determined that cleanup was not needed (PWT, 2019a).

XRF calculation of ICP equivalent concentrations for arsenic and lead was performed in accordance with the OU1 QAPP, with a minimum of 10% of the soil samples submitted for laboratory confirmation analysis via ICP-MS. Correlations were developed to allow calculation of adjusted XRF concentrations that were comparable to the ICP-MS results, which are summarized in the *Technical Memorandum, X-Ray Fluorescence Correlation Analysis* (PWT, 2020b).

For the risk assessment, soil data generated using XRF were adjusted to ICP-equivalent concentrations using linear regression equations derived from the paired correlation analyses presented in PWT (PWT, 2015a; 2015b; 2020b) as follows:

[ICP-equivalent concentration] = a + b [XRF concentration]

where:

a = intercept from the ICP/XRF regression line for contaminant "i"

b = slope from the ICP/XRF regression line for contaminant "i"

The XRF results produced by PWT were these ICP-equivalent concentrations and for all soil risk calculations for arsenic, lead, copper, manganese, and zinc until November 2020 (PWT, 2020b). The XRF adjustment factors used in the OU1 RI for arsenic is 0.7134, lead is 0.9872, copper is 0.8085, manganese is 0.8128, and zinc is 0.8894 (PWT, 2020b).

2.3.5 Biota Data

This document incorporates the available environmental data collected from the Site, including biota sampling conducted in 2023 under Revision 3 of the OU2 QAPP (PWT, 2023b). Biota samples include:

- Aquatic invertebrates – collected with sweep nets (Figure 8)
- Small mammal (mice) – collected from only DU-0023 (Figure 9)
- Fish from the Arkansas River (upstream and downstream), Runyon Lake, Fountain Lake
- Terrestrial invertebrates – collected with sweep nets (Figure 9)
- Plants (forbs, shrubs, grass) (Figure 9)

Biota sampling included 25 composite fish samples, 12 composite terrestrial invertebrate samples, 12 aquatic invertebrate samples, and 12 vegetation samples.

A breakdown of the biota samples collected in 2023 by location is presented below. Samples were analyzed to total recoverable metals (ICP-MS) and mercury (Method 7473) and percent solids at the Environmental Services Assistance Team (ESAT) laboratory in Denver Colorado. Appendix B summarizes the analytical sampling data from the biota samples.

- Former Smelter (OU2, sub areas A and B):
  - Seven terrestrial invertebrate and vegetation samples
  - Five small mammal samples from DU-0023

  - Three aquatic invertebrate samples
- Runyon/Fountain Lakes (sub area F):
  - Three terrestrial invertebrate and vegetation samples
  - Five aquatic invertebrate samples
  - Runyon Lake with 12 rainbow trout, six saugeye, eight catfish, and two walleye. Resulting in three rainbow trout composite samples (filet and offal), three saugeye composite samples (filet and offal), three catfish composite samples (filet and offal), and one walleye composite samples (filet and offal) for a total of 20 analytical samples.
  - Fountain Lake with 12 rainbow trout and four catfish. Resulting in three rainbow trout composite samples (filet and offal) and two catfish composite samples (filet and offal) for a total of 10 analytical samples.
- East Open Space (sub area G)
  - One terrestrial invertebrate and vegetation samples
- West Open Space (sub area D)
  - Two terrestrial invertebrate and vegetation samples
- Arkansas River
  - Four aquatic invertebrate samples
  - Upstream Arkansas River above Wildhorse Creek and below Pueblo Boulevard with 12 rainbow trout and 12 brown trout. Resulting in three rainbow trout composite samples (filet and offal) and three brown trout composite samples (filet and offal) for a total of 12 analytical samples.
  - Downstream Arkansas River above BNSF railroad bridge and below Moffat Street bridge with 11 rainbow trout and one brown trout. Resulting in three rainbow trout composite samples (filet and offal) and one brown trout composite sample (filet and offal) for a total of eight analytical samples.

Whole body concentrations will be used in the BERA and were calculated using the following equation:

$$C_{wb} = (C_f \times W_f + C_o \times W_o) / (W_f + W_o)$$

Where:

C_{wb} = Whole body concentration (mg/kg)

C_f = Concentration in fillet (mg/kg)

C_o = Concentration in offal (mg/kg)

W_f = Weight of fillet (grams)

W_o = Weight of offal (grams)

Tissue concentrations were all converted to dry weight using the following equation:

$$C_{dw} = C_{ww} / P_s \times 100 \text{ or } C_{dw} = C_{ww} /(1\text{-}\% \text{ water} - \text{as a decimal})$$

Where:

C_{dw} = Concentration dry weight (mg/kg)

C_{ww} = Concentration wet weight (mg/kg)

P_s = Percent solids (%)

3.0 Constituents of Potential of Ecological Concern

3.1 SLERA COPECs

The initial list of contaminants investigated in Steps 1 and 2 included all inorganic and organic contaminants identified or suspected at the Site. Appendix C presents the conservative screening of surface water, pore water, and sediment. As discussed in Section 2.3, additional surface water, sediment, and pore water samples were collected in 2023 and 2025. These data were combined with the data presented in the SLERA (USEPA/OTIE/PWT, 2024). The SLERA soil data screening was not revised and is presented in the SLERA as an evaluation of the revised data set did not alter the list of SLERA COPECs (Table 3-1).

Surface water and pore water data were organized by location, onsite ravine, or off site from the Arkansas River and Runyon Lake. Water hardness is significantly different between the onsite and off-site water bodies. Aluminum, cadmium, chromium, copper, lead, manganese, nickel, silver, and zinc concentrations were screened using hardness dependent benchmarks as defined by 5 CCR 1002-32, TVS. Surface water sampling locations were broken out between onsite ravines, which have an average hardness of 1,279 mg/L; however, the maximum default value is 400 mg/L and the Arkansas River and Runyon Lake used an average hardness of 200 mg/L. Note that the calculation for aluminum uses a hardness no greater than 220 mg/L.

3.2 COPEC Special Considerations - Chromium

Chromium is a naturally occurring element (mineral) in rocks, animals, plants, and soil. Chromium has seven oxidation states, three of which are most prevalent in the environment (+2, +3, and +6). Trivalent chromium (Cr+3) is the most common oxidation state and is an essential dietary element, which aids in normal glucose, protein, and fat metabolism (ATSDR 2012). Hexavalent chromium (Cr+6) is the most toxic chromium ion and is a known human carcinogen. Hexavalent chromium is almost exclusively anthropogenic in nature. Sources of hexavalent chromium compounds found in the environment are from the discharges of dye and paint pigments, wood preservatives, and chrome-plating liquid wastes. The greatest use of hexavalent chromium is in metal alloys, such as stainless steel, protective coatings on metal, magnetic tapes, pigments for paints, cement, paper, rubber, and composite floor covering. Historical processes associated with the smelter are unlikely to have contained hexavalent chromium. Of the various industrial processes that took place onsite, refining ores potentially containing chromium and the use of coal-fired furnaces potentially could have released chromium into the air.

The presence of trivalent chromium in soil is favored by higher pH (more basic), aerobic conditions, low amounts of organic matter, and the presence of manganese and iron oxides. Trivalent chromium is cationic and adsorbs onto clay particles, organic matter, metal oxyhydroxides, and other negatively charged particles in contrast to hexavalent chromium, which does not interact significantly with clay or organic matter. The average soil pH at the site is 6.9.

Chromium and hexavalent chromium are both considered SLERA COPECs. In Runyon Field, hexavalent chromium was detected in 25 of 32 samples with a range of detections from 0.088 mg/kg to 18.4 mg/kg. Total chromium was analyzed in two samples with detections of 15.3 and 21.5 mg/kg (PWT, 2019). Sufficient sample numbers of total chromium were not available to make an estimate of the percentage of hexavalent chromium of the total.

Total chromium and hexavalent chromium data are also available from OU2 soils with sufficient samples for both chromium and hexavalent chromium for comparison (Table 3.2). The following conclusions can be drawn from this data set:

- DU-001 has the largest percentage of hexavalent chromium from all the samples analyzed. The largest percentage of hexavalent chromium is 25.2% from DU-0001 (0-1 inch) with a total chromium value of 13 mg/kg and hexavalent chromium at 3.27 mg/kg. Soil depths 1-6 inches and 6-12 inches have 17.6% and 10.5% hexavalent chromium, respectively.
- There is no clear pattern on the percentage of hexavalent chromium by depth or DU, besides DU-001.
- Hexavalent chromium is present at 8.9% and 0.04% detections as compared to total chromium.
- If data and appropriate benchmarks are available, the total and hexavalent chromium should be evaluated separately, as in, do not assume that all detected chromium is hexavalent chromium.

A summary of updated SLERA COPECs by media is presented in Table 3-1 below and a summary of chromium and hexavalent chromium data is presented in Table 3-2 found in the Tables section at the end of this document.

Table 3-1. Summary of COPECs by Media Identified in the SLERA

Surficial Soil	Sediment – Onsite Ravines	Surface Water - Onsite Ravines	Pore Water - Onsite Ravines	Sediment – Arkansas River/Runyon Lake	Surface Water –Arkansas River/Runyon Lake	Pore Water – Arkansas River/Runyon Lake
Antimony	Antimony	Aluminum	Aluminum	Antimony	Aluminum	Aluminum
Arsenic	Arsenic	Arsenic	Arsenic	Barium	Arsenic	Arsenic
Barium	Barium	Cadmium	Copper	Cadmium	Lead	Iron
Beryllium	Cadmium	Copper	Iron	Copper	Selenium	Lead
Cadmium	Copper	Iron	Lead	Lead	--	Mercury
Chromium	Lead	Lead	Manganese	Manganese	--	Selenium
Hexavalent Chromium	Manganese	Mercury	Mercury	Mercury	--	--
Cobalt	Mercury	Selenium	Selenium	Selenium	--	--
Copper	Nickel	Vanadium	Zinc	Zinc	--	--
Lead	Selenium	Zinc	*Pentachlorophenol*	Bis(2-ethylhexyl)phthalate	--	--
Manganese	Silver	*Pentachlorophenol*	--	--	--	--
Mercury	Vanadium	--	--	--	--	--
Nickel	Zinc	--	--	--	--	--
Selenium	Acenaphthene	--	--	--	--	--
Silver	Acenaphthylene	--	--	--	--	--
Thallium	Benzo(a)anthracene	--	--	--	--	--
Vanadium	Benzo(a)pyrene	--	--	--	--	--
Zinc	Benzo(g,h,i)pyrene	--	--	--	--	--
High Molecular Weight PAHs	Benzo(k)fluoranthene	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	Chrysene	--	--	--	--	--

Surficial Soil	**Sediment – Onsite Ravines**	**Surface Water - Onsite Ravines**	**Pore Water - Onsite Ravines**	**Sediment – Arkansas River/Runyon Lake**	**Surface Water –Arkansas River/Runyon Lake**	**Pore Water – Arkansas River/Runyon Lake**
Acetone	Fluoranthene	--	--	--	--	--
Toluene	Phenanthrene	--	--	--	--	--
Pentachlorophenol	Pyrene	--	--	--	--	--
--	Carbon disulfide	--	--	--	--	--
--	Bis(2-ethylhexyl)phthalate	--	--	--	--	--
--	*Pentachlorophenol*	--	--	--	--	--

Pentachlorophenol carried forward based on bioaccumulation potential

3.3 Refinement of COPECs

Because of the conservative assumptions used during the SLERA, some contaminants retained for the BERA might pose negligible risk. Based on known Site contaminants, all the retained metals are assumed to be COPECs; however, a weight of evidence analysis for the organic contaminants is included in the Problem Formulation section of the BERA. This assessment is specific to detected organic constituents, as it is assumed that all of the inorganic SLERA COPECs will be carried forward for analysis in the BERA.

SLERA COPECs were defined by at least a 5% frequency of detection (FOD) and a comparison of maximum detected concentrations with a conservative media-based screening value without consideration of lines of evidence that might indicate that the potential ecological risk is negligible. The analysis in the BERA will examine the organic SLERA COPECs and make a recommendation on if they should be considered as BERA COPECs.

Appendix C of the SLERA presents the toxicity benchmarks used for determination of the COPECs. The benchmarks identified in the SLERA are concentration-based (e.g., the concentration in soil, sediment, or surface water). Each benchmark is contaminant-specific, receptor-specific (e.g., freshwater water column, benthic invertebrate, soil invertebrate, and plant community), and medium-specific. Some of the benchmarks account for bioaccumulation and protection of birds and mammals, such as the USEPA EcoSSL, but the majority of the benchmarks are protective of the community-based receptors (e.g., benthic invertebrate community).

To assess if a SLERA COPC should be carried forward into the BERA, multiple lines of evidence will be reviewed. Lines of evidence could include a review of the environmental fate (e.g., bioaccumulative), FOD across all assessed media, and a comparison to no-effect and low-effect based screening values from published sources such as Los Alamos National Laboratory (LANL) ECORISK database (Version 4.4, November 2024) and USEPA Region 4 screening levels (sediment only). Other peer-reviewed published sources will be considered. To assess the potential ecological risk to wildlife from the SLERA organic COPECs, the LAN) ECORISK database (Version 4.4, November 2024) will be reviewed for wildlife media-based screening levels.

4.0 Conceptual Site Model

The conceptual site model (CSM) is the foundation of a risk assessment. It is formulated based on knowledge of sources, contaminants, complete exposure pathways, and receptor groups for the different habitat areas. Figure 10 is a diagrammatic representation of the CSM. This CSM was presented in the SLERA.

Development of the CSM involves a description of exposure scenarios or how the contaminant interacts spatially and temporally with ecological components in the area under consideration. Contaminant sources, environmental transport, partitioning, chemical or biological transformation, and potential exposure routes are all considered in these scenarios. CSM exposure scenarios most likely to contribute to risk are used as input to the assessment's analysis phase (USEPA, 1992) and may be refined as additional information and data are obtained.

4.1 Contaminant Fate and Transport

The goal of the contaminant fate and transport evaluation is to identify the major elements of a complete exposure pathway. These elements include: 1) source(s) of contamination; 2) release and transport mechanisms; 3) contact points and exposure media; 4) routes of entry; 5) key receptors; and 6) exposure pathways.

4.1.1 Sources of Contamination

The primary sources of contamination for OU2 include smelter waste piles and smelter contamination from air deposition from stack, roaster, forge, and kiln emissions. Secondary sources of contamination include railroad-associated debris, including clinkers generated from train engines (coal and coke fuels), highway emissions (leaded fuel), and residential and commercial building area debris including solvents, pesticides, liquid fuels, lead based paint, and other materials.

4.1.2 Release and Transport Mechanisms

Contamination from the smelter or associated waste can physically migrate to other locations, thereby contaminating other environments. The transport processes involved in this are termed release mechanisms. Several release and transport mechanisms potentially affect the levels and spatial distribution of contaminants in the terrestrial and aquatic habitats of the Site. In general, the mechanisms that are associated with smelting and mining-related activities include:

- Wind transport of contaminated soil or materials. Soil or particulate material may be transported by air following wind erosion events. Disturbance of contaminated soil or materials may facilitate wind erosion, thereby increasing contaminant movement and receptor exposures.
- Physical dispersal of contaminated soil or materials. Soil or particulate materials may be disturbed by anthropogenic, animal, or plant activity. Burrowing animals may uncover contaminated materials. Fallen trees may expose roots surrounded by contaminated materials. Anthropogenic activities, such as construction, may also disturb contaminated materials, making contaminated media more susceptible to wind and water transport.

- Water transport of contaminated soil or materials. Soil or particulate material may be transported by rainfall or water runoff. Water activity can transport contaminated materials overland or in the water as sediment.
- Leaching of contaminated soil or materials. Temporary or permanent immersion in water can result in contaminant transfer from one medium (e.g., air, soil) to an aquatic one. Contaminants can remain in solution in the aquatic environment, re-adsorb to another aquatic media, such as sediment or organic matter, be ingested, or partition otherwise into aquatic organisms. Aquatic organisms can be exposed to water or sediment contaminants. Terrestrial organisms can ingest contaminated surface or groundwater.
- Trophic transport of contaminants. Ingestion, adsorption, or absorption of contaminants into organisms in terrestrial or aquatic food chains can result in organisms that carry a burden of contaminants ("bioaccumulation"). Ingestion of contaminated organisms by organisms higher on the food web can result in biomagnification of the contaminant in higher level organisms.

4.1.3 Contact Points and Exposure Media

The BERA evaluates the contact points associated with the terrestrial and aquatic habitats at and around smelter waste piles, overbank soils, sediments, water, and other contaminated materials throughout the Colorado Smelter area. The exposure media include mine waste, contaminated soil, sediment, organic debris, and water.

4.1.4 Routes of Entry

The main routes of entry evaluated in the BERA for terrestrial and aquatic community-level receptors and wildlife receptors feeding on those community level receptors and other prey items include:

- Direct contact with surface water (fish and water-column invertebrates)
- Direct contact with pore water (benthic invertebrates)
- Direct contact with sediment (benthic invertebrates)
- Ingestion of surface water (wildlife receptors)
- Incidental ingestion of sediment while feeding (wildlife receptors)
- Direct contact with soil (plant and soil invertebrate communities)
- Incidental ingestion of soil while feeding (wildlife receptors)
- Ingestion of contaminated prey items (all receptor groups, quantified via food chain modeling)

The groundwater-to-surface-water pathway is potentially complete based on the presence of seeps. Direct contact with surface water and pore water will be used in the BERA to evaluate this potential pathway.

4.1.5 Key Receptor Groups

Terrestrial and aquatic community-level receptors. The BERA will assume that terrestrial and aquatic plants, animals, and invertebrates are directly exposed to smelter-related contaminants in terrestrial and aquatic habitats associated with mine waste piles, overbank soils, and other materials.

Wildlife receptors feeding on food items. The BERA will assume that the following general types of wildlife receptors may become exposed to smelting-related contaminants in terrestrial and aquatic habitats associated with smelter waste piles, overbank soils, and other media at the Site: a) herbivorous birds and mammals, b) omnivorous birds and mammals, and c) carnivorous/ piscivorous birds and mammals.

4.1.6 Exposure Pathways

Complete exposure pathways are how the COPECs can be transferred from a contaminated medium to the target receptors. Complete exposure pathways include the following four elements:

1) A source of contamination (e.g. slag waste, overbank soils, mine tailings).
2) Environmental transport and/or exposure media (e.g., leaching of contaminants into water, soil adsorption, and exposure from hydrologic or atmospheric events).
3) Contaminant interaction with a target receptor (e.g., direct ingestion, inhalation, dermal contact, secondary contact through contaminated food).
4) A target receptor and likely route of exposure (e.g., animal swimming or feeding in contaminated water, plant growing in contaminated soil).

The BERA will consider all four exposure elements present at the Colorado Smelter Site in OU2, and urban park habitats associated with OU1. The BERA will evaluate the following exposure pathways:

- Benthic invertebrates: direct contact with sediment and pore water.
- Water-column invertebrates and fish community: direct contact with surface water.
- Soil invertebrates and terrestrial plant community: direct contact with soil.
- Herbivorous aquatic birds and mammals: ingestion of surface water, sediment, and vegetation.
- Omnivorous aquatic birds and mammals: ingestion of surface water, sediment, benthic invertebrates, fish, and vegetation.
- Insectivorous aquatic birds: ingestion of surface water, sediment, benthic invertebrates, and fish.
- Piscivorous aquatic birds: ingestion of surface water, sediment, and fish.
- Herbivorous terrestrial birds and mammals: ingestion of soil and vegetation.
- Insectivorous terrestrial birds: ingestion of soil and soil invertebrates.
- Omnivorous terrestrial uplands birds and mammals: ingestion of soil, soil invertebrates, and vegetation.
- Omnivorous terrestrial wetlands mammals: ingestion of soil, soil invertebrates, and vegetation.
- Carnivorous terrestrial uplands birds and mammals: ingestion of soil and small mammals.

4.2 Exposure Areas

This BERA will assess risks in terrestrial and aquatic areas using both the abiotic media data and the biota data. This section describes the exposure areas to be evaluated in the BERA.

4.2.1 Terrestrial Exposure Areas

At the time the SLERA was prepared, soils from 38 half-acre DUs were sampled within OU2 Former Smelter Area, and 89 one-acre DUs were sampled from the Undeveloped Areas. Figure 6 shows the DUs to be evaluated in the BERA, including the UPRR Right-of-way. Additionally, the municipal parks: Bendict Park, Bessemer Park, Stauter Field, Moynihan Park, and Runyon Field will be evaluated for the American robin and deer mouse. Ecological risks will be calculated for each DU using exposure modifications based on the home range of the receptor.

4.2.2 Aquatic Exposure Areas

Aquatic areas include the Arkansas River, Runyon Lake, Fountain Lake, and perennial and intermittent streams that travel through the ravines inside and outside of OU2 (Figure 1). Aquatic areas also include channelized portions of the Arkansas River. In these areas, concrete flood levees have channelized river flow, resulting in hydrodynamics more typical of steep elevation water courses.

5.0 Assessment and Measurement Endpoints

Assessment endpoints are those characteristics in the ecological system that are to be "protected." These endpoints are synonymous with a healthy and self-sustaining population or community. They generally reflect sensitive populations, communities, or trophic guilds. Listed below are four general criteria for selecting the assessment endpoints that will be used in the BERA. The ecological resources should:

- be susceptible to the stressors of concern,
- have life history and toxicity effects information available from the open literature,
- have biological, social, and /or economic value, and
- be relevant to the risk management goals for the site.

By considering these selection criteria, risks identified to one or more of the assessment endpoints will support the future risk management decision process.

Measurement endpoints represent measurable ecological characteristics, quantified through laboratory or field studies, which can be related back to the valued ecological resources chosen as the assessment endpoints. Measurement endpoints are required, because it is often not possible to directly quantify risk to an assessment endpoint. The measurement endpoints should represent the same exposure pathway(s) and mechanisms of toxicity as the assessment endpoints in order to be relevant and useful in supporting risk-based decision making.

Risk questions establish a link between assessment endpoints and their predicted responses when exposed to contaminants. The risk questions should provide a basis to develop the study design and evaluate the results of the investigation in the analysis phase and during risk characterization (USEPA, 1997).

5.1 Selection of Representative Assessment Endpoint Species or Communities

It is neither practical nor possible to evaluate the potential for ecological risk to all the individual parts of the local ecosystems affected by site-related contaminants. Instead, key components are identified to select those species or groups most likely to experience exposure to contaminants.

Site visits, quantitative surveys, and relevant literature inform assessors as to the occurrence of aquatic and terrestrial species on or adjacent to OU1 and OU2. Since many receptors are highly mobile geographically, species occurrence in the entire county of Pueblo has been used in some cases to outline species potentially present in OU1 and OU2. Section 3.3 of the SLERA provides a detailed listing of potential receptors by receptor group (e.g., fish, benthic invertebrates, amphibians, terrestrial plants, soil invertebrates, reptiles, birds and mammals). Section 3.3 of the SLERA also presents a listing of Federally Endangered, Threatened, Candidate, or Species of Concern for Pueblo County, including the eastern black rail (*Laterallus jamaicensis* ssp. j*amaicensis*) and monarch butterfly (*Danaus plexippus*). Following consultation with the United States Fish and Wildlife Service (USFWS), the black rail is not expected to occur at the Site. Table 5-1 summarizes the receptors and exposure media.

5.1.1 Aquatic and Benthic Invertebrate Communities (Arkansas River, Runyon Lake and Perennial Streams)

Contaminants with the potential to bioaccumulate can be transferred from sediment, surface water, and/or pore water into the aquatic and benthic invertebrate communities and up the local aquatic food chain, thereby harming the invertebrates themselves, the local fish, or higher trophic-level receptors that feed on them. The water-column community encompasses aquatic plants and zooplankton, as well as other key species that could include but are not limited to copepods and cladocerans. Significant alterations in aquatic plants and aquatic and benthic invertebrate communities could also impact the energy cycling at the base of the aquatic food chain.

5.1.3 Fish Communities (Arkansas River and Runyon Lake)

The presence of metals in the surface water and sediment in local waterways can impair the fish community in two general ways: 1) mortality due to direct exposure to dissolved metals in the water column, or 2) high metal concentrations in aquatic biota via food chain uptake which could affect reproduction and the long-term survival of the exposed fish. Fish species collected as part of the biota sampling included brown trout (*Salmo trutta*), channel catfish (*Ictalurus punctatus*), rainbow trout (*Oncorhynchus mykiss*), and walleye (*Sander vitreus*). These species encompass different trophic levels (invertivore vs top predator) and water column feeding positions (bottom feeders vs pelagic feeders).

5.1.4 Terrestrial Invertebrate Communities (Uplands and Wetlands)

Contaminants with the potential to bioaccumulate can be transferred from soil into the terrestrial invertebrate community (e.g., earthworms, beetles, grasshoppers) and up the local terrestrial food chain, thereby harming the invertebrates themselves or higher trophic-level receptors that feed on them. Significant alterations in the terrestrial invertebrate communities could also impact the energy cycling at the base of the terrestrial food chain.

5.1.5 Terrestrial Plant Communities (Uplands and Wetlands)

The presence of metals in the soil can impair the plant community in two general ways: 1) reduced productivity or mortality due to direct exposure to metals in soil, or 2) uptake of metals into plant tissues and then into the food chain uptake, which could affect reproduction and the long-term survival herbivorous or omnivorous ecological receptors.

5.1.6 Wildlife Receptors (Aquatic Systems)

Several aquatic-dependent bird and mammal species can be expected to feed on aquatic prey obtained from the Arkansas River, Runyon Lake, and the perennial streams. The following target wildlife receptors will be evaluated in the BERA. These species are representative of different feeding guilds and trophic levels.

<u>Belted Kingfisher (*Ceryle alcyon*) – Piscivorous Aquatic Bird</u>

The belted kingfisher is an aquatic-dependent piscivorous bird typically found along the edges of rivers, streams, lakes, and ponds. The kingfisher requires shallow water (typically < 60 cm deep) that is free of vegetation and remains relatively clear to be able to spot its prey. It feeds predominantly on small fish (<18 cm) that it captures near the surface of the water. These feeding habits place this receptor high in

the food chain. This species was selected for use in food chain modeling to represent piscivorous birds with relatively small home ranges. The kingfisher will be evaluated for exposure from the Arkansas River and Runyon Lake. Analytical data from fish tissue, surface water, and sediment will be used to assess risk. Home range is assumed to be 3.11 acres, which is the average of four literature values (Brook and Davis, 1987; Davis, 1982).

American Dipper (*Cinclus mexicanus*) – Insectivorous Aquatic Bird

The American dipper is an aquatic-dependent invertivore that forages on the bottom of fast-moving rocky streams in mountainous regions of the western U.S. It dives to the bottom of the stream, where it seeks out mainly aquatic insects and their larvae. This species was selected for use in food chain modeling to represent birds which feed on aquatic invertebrates. The American dipper will be evaluated for exposure from the perennial ravine streams and the Arkansas River. Analytical data from aquatic invertebrates, surface water, and sediment will be used to assess risk. Territories follow linearly along the stream and can range from 759 m to 2,070 m during the breeding season (Anderson, 2002), but the foraging area of 3 acres based on the belted kingfisher will be used in the BERA.

Mallard Duck (*Anas platyrhynchos*) – Herbivorous Aquatic Bird

The mallard is a medium to large dabbling duck and is the most abundant duck species in North America. This species is found in all flyways and in almost any freshwater habitat. Mallards primarily nest on the ground in grasslands, and once hatched, broods may travel long distances between the nest and wetlands. Mallards occur year-round throughout North America, but most individuals are migratory and breed in the northern United States and Canada and winter in the Southern United States and Mexico. Mallards are generalist foragers and will eat a wide variety of food. They do not dive but dabble to feed, tipping forward in the water to eat seeds and aquatic vegetation. They also roam around on the shore and pick at vegetation and prey on the ground. During the breeding season, they eat mainly animal matter including aquatic insect larvae, earthworms, snails, and freshwater shrimp. In the BERA model, it is assumed that they consume 10% invertebrates and 90% plants (USEPA, 1993). Analytical data from aquatic invertebrates, plant tissue, surface water, and sediment will be used to assess risk. The mallard duck will be evaluated for exposure to the Arkansas River and Runyon Lake. Home range is assumed to be 1074 acres which is the average of four literature values (Dwyer et al., 1979; Kirby et al., 1985; and USEPA, 1993).

Muskrat (*Ondatra zibethicus*) – Herbivorous Aquatic Mammal

The muskrat is a large, semi-aquatic rodent with dense under-fur and a nearly waterproof "overcoat." Muskrats live statewide in marshes, ponds, and slow streams, often in areas dammed by beavers. Muskrats are herbivores, eating mostly grasses, cattails, bulrushes, and other marsh plants. They occasionally damage cornfields on flood plains, and their burrowing sometimes weakens ditch banks and levees (https://cpw.state.co.us/species/muskrat). The muskrat will be evaluated for exposure from the Arkansas River and Runyon Lake and will use analytical data from plants, surface water, and sediment. Home range is assumed to be 0.33 acres, which is the mean of five values from USEPA (USEPA, 1993).

Raccoon (*Procyon lotor*) – Omnivorous Aquatic Mammal

The raccoon is a nocturnal omnivore that lives in mixed forests, coastal marshes, and urban areas. It feeds on a wide variety of food items, including but not limited to invertebrates, plants, fish, amphibians, small birds, and mammals. This species is retained for use in food chain modeling as an aquatic-dependent omnivorous mammal. The raccoon will be evaluated for exposure from the Arkansas River, Runyon Lake, perennial streams, and ravine wetlands. Analytical data from aquatic invertebrates, fish, surface water, and sediment will be used to assess risk. Home range is assumed to be 96 acres, which is the lowest mean value for year-round home range listed in USEPA (USEPA, 1993).

5.1.7 Wildlife Receptors (Wetlands around Ravines)

Several receptors will be assessed for exposure in the transitional areas between aquatic and terrestrial areas, primarily the wetlands in the ravines (Figure 8).

Red-Winged Blackbird (*Agelaius phoeniceus*) – Omnivorous Wetland Bird

Red-winged blackbirds spend the breeding season in wet places like fresh or saltwater marshes and rice paddies. You may also find them breeding in drier places like sedge meadows, alfalfa fields, and fallow fields. Occasionally, red-winged blackbirds nest in wooded areas along waterways. In fall and winter, they congregate in agricultural fields, feedlots, pastures, and grassland. Red-winged blackbirds eat mainly insects in the summer and seeds, including corn and wheat, in the winter. Sometimes they feed by probing at the bases of aquatic plants with their slender bills, prying them open to get insects hidden inside. In fall and winter, they eat weedy seeds, such as ragweed and cocklebur, as well as native sunflowers and waste grains (allaboutbirds.org). The red-winged blackbird will be evaluated for exposure from the ravine areas. Perennial wet areas using analytical data from terrestrial invertebrates, plant tissue, surface water, and soil. Home range is assumed to be 6.9 acres (Odum and Kuenzler, 1955).

Marsh Wren (*Cistothorus palustris*) – Insectivorous Wetland Bird

The marsh wren will be evaluated for exposure in the wetland areas as an insectivorous bird. The marsh wren consumes large numbers of benthic and aquatic invertebrates, snails, and spiders. Its main predators are snakes and turtles that prey upon their eggs. It is a common inhabitant of freshwater marshes. Analytical data from aquatic invertebrates, surface water, and sediment will be used to assess risk in the wetland, perennial water areas. Home range is assumed to be 0.134 acres, which is based on the mean from Kale (1965), Verner (1965) and Leonard and Picman (1986).

Meadow Vole *(Microtus pennsylvanicus)* – Omnivorous Wetland Mammal

The meadow vole will be evaluated for exposure from the wetland areas. They primarily occur from north to south central Colorado and along the South Platte River. They tend to live in or near damp marshy areas or wet meadows and riparian corridors. Voles are active day and night throughout the year and do not hibernate. They usually live between two and six months. Their home ranges usually are less than one-fourth acre and vary with season, food supply, and population density. Voles construct many surface runways and underground tunnels with numerous burrow entrances. A single burrow may contain several adults and young (https://extension.colostate.edu/). Voles are generally herbivores that feed on grasses, tree bark, roots, tubers, and vegetable crops. During times when plant food is scarce, voles eat small insects or the remains of dead animals. Analytical data from terrestrial invertebrates,

plants, surface water, and soil will be used to assess risk. Home range is assumed to vary from 2.3 acres (Sullivan, 1996).

5.1.8 Wildlife Receptors (Terrestrial Systems)

Mourning Dove (*Zenaida macroura*) – Herbivorous Terrestrial Bird

Mourning doves can be found in a variety of habitats from the desert (near water) to open woodland, agricultural areas with scattered trees, and suburbs. They nest in a horizontal tree branch fork, on the ground, on deserted nests of other species, or anywhere else providing solid support (Ehrlich, Dobkin, and Wheye 1988). Mourning doves are very adaptable. Waste grains and weed seeds associated with farming practices have become important food sources. Ornamental trees planted in cities and towns have also increased the amount of nesting and roosting habitat for mourning doves. Doves are primarily seedeaters. More than 99% of their diet is composed of weed seeds and grains. Preferred weed seeds include pigweed, foxtails, wild sunflower, and ragweed. Doves also feed on grains like sorghum, sunflower, millet, and wheat. Insects typically make up less than 1% of the dove diet. Daily feeding movements of young and adults average 2-8 miles and they require a daily supply of water (https://cpw.state.co.us/). Analytical data from plants, surface water and soil will be used to assess risk in the upland terrestrial areas. Home range is assumed to be 40 acres (personal communication with dove hunters). Note that Losito and Mirarchi (1991) report much higher values; however, fledglings may be confined to 1-2 acres (Hitchcock and Mirarchi 1986).

American Robin (*Turdus migratorius*) – Omnivorous Terrestrial Bird

American robins are common birds across the continent. They can be found on lawns, fields, and city parks, as well as in more wild places like woodlands, forests, mountains up to near treeline, recently burned forests, and tundra. During winter many robins move to moist woods where berry-producing trees and shrubs are common. American robins eat large numbers of both invertebrates and fruit. Particularly in spring and summer, they eat large numbers of earthworms, as well as insects and some snails. Robins also eat an enormous variety of fruits, including chokecherries, hawthorn, dogwood, and sumac fruits, and juniper berries (www.allaboutbirds.org). Analytical data from plants, terrestrial insects, surface water, and soil will be used to assess risk in the upland terrestrial areas. Their diet will be assumed to be 50% plants and 50% terrestrial insects. Home range is assumed to be 1.04 acres. The value from Pitts (1984) was selected due to the large sample size (n=62) and because observations were made over a 7-year period.

Red-Tailed Hawk (*Buteo jamaicensis*) – Carnivorous Terrestrial Bird

Red-tailed hawks occupy just about every type of open habitat on the continent. This includes desert, scrublands, grasslands, roadsides, fields and pastures, parks, and woodlands. Mammals make up the bulk of most of their meals. Frequent prey includes voles, mice, wood rats, rabbits, snowshoe hares, jackrabbits, and ground squirrels. The hawks also eat birds, including pheasants, bobwhite, starlings, and blackbirds, as well as snakes and carrion (www.allaboutbirds.org). Analytical data from small mammals, surface water, and soil will be used to assess risk in the upland terrestrial areas. Home range is assumed to be 1,772 acres. Home range is the average of empirical values from Craighead & Craighead (1956) for fields and woods in Michigan. Home range in upland prairie habitats may be larger (e.g., 2,000-6,000 acres) (Andersen et al. 1989).

Mule Deer (*Odocoileus hemionus)* – Herbivorous Terrestrial Mammal

Mule deer are an icon of the American West, an economic resource and an indicator species for the health of important landscapes. Colorado plays host to the largest population of mule deer in the world. Mule deer occupy any "edge" habitat, including suburban residential areas. Deer are browsers, feeding mostly on woody vegetation, including twigs and leaves of shrubs, trees, and ornamentals. They also forage on crops, especially corn. Because they eat little grass, they tend not to compete seriously with livestock or elk (https://cpw.state.co.us/). Analytical data from plants, surface water, and soil will be used to assess risk in the upland terrestrial areas. Home range is assumed to be 705 acres (Anderson and Wallmo, 1984).

Deer Mouse (*Peromyscus keeni*) – Omnivorous Terrestrial Mammal

The deer mouse nests in burrows in the ground, trees, stumps, and buildings and inhabits nearly all types of dry-land habitats within their range, which can include short grass prairies, grass-sage communities, sand dunes, wet prairies, upland mixed and cedar forests, deciduous forests, and ponderosa pine forests (Holbrook 1979; Kaufman and Kaufman 1989; Ribble and Samson 1987; Wolff and Hurlbutt 1982). Deer mice are omnivorous and highly opportunistic. The deer mouse diet includes soil invertebrates (arthropods, lepidopteran larvae, and adults), as well as plant material (fruits, green vegetation, nuts/seeds) (Wolff, Dueser, and Berry 1985). Analytical data from plants, terrestrial insects, surface water, and soil will be used to assess risk in the upland terrestrial areas. Home range is assumed to be 0.084 acres, which is the average of two home ranges for snow-free alpine meadows from Cranford (1984).

Red Fox (*Vulpes vulpes*) – Carnivorous Terrestrial Mammal

The red fox can be found in most of Colorado. They are common in open woodlands, pasturelands, riparian areas, and agricultural lands. Red fox can also be successful urban dwellers and often dwell on the margins of urbanized areas. Red fox are opportunistic omnivores and are skilled predators and scavengers. They will kill and eat ground nesting birds and their eggs, small mammals, insects, amphibians, fish, crayfish, earthworms, fruits, berries, nuts and carrion. A typical home range for a red fox is 5-10 square miles depending on food availability. Males tend to travel farther than females, but juveniles dispersing from their parents will often travel the farthest. Adult red fox will typically stay within a mile of their den while they are raising pups (https://cpw.state.co.us/). Analytical data from small mammals, surface water and soil will be used to assess risk in the upland terrestrial areas. Home range is assumed to be 2,565 acres which is the average reported in Jones and Theberge, 1982; Sargent 1972 and Ables, 1969 (all listed in USEPA, 1993).

5.2 Endpoint Selection

The following assessment endpoints will be used to evaluate the potential for ecological risks to the targeted receptor groups in at the Site and surrounding ecological systems. A risk question is appended to each assessment endpoint. Measurement endpoints describe how each assessment endpoint will be addressed

Assessment Endpoint #1: Maintain a stable and healthy benthic invertebrate community: Are the contaminant levels in sediment and pore water high enough to affect survival, growth, or reproduction in the benthic invertebrate communities?

Measurement Endpoints #1:

- Compare the metal levels in individual bulk sediment samples to sediment no-effect and low-effect Ecological Screening Values (ESVs).
- Compare the dissolved metals levels in pore water samples to surface water chronic and acute ESVs.

Assessment Endpoint #2: Maintain a stable and healthy water-column invertebrate and fish community: Are the contaminant levels in surface water high enough to affect survival, growth, or reproduction in the water-column invertebrates and fish communities?

Measurement Endpoints #2:

- Compare the total and dissolved metal concentrations in surface water to chronic and acute freshwater ESVs.
- Assess the presence or absence of fish and aquatic invertebrates in the field. The quality of the physical habitat will be evaluated in each habitat area to assess its suitability to support fish populations.
- Compare fish tissue and aquatic invertebrate data to body burden data correlated reported in the open literature.

Assessment Endpoint #3: Maintain stable and healthy aquatic-dependent bird and mammal assessment populations[2]: Are the contaminant levels in surface water, sediment, and food items enough to affect survival, growth, or reproduction in aquatic-dependent birds and mammals?

Measurement Endpoint #3:

- Use metal levels measured in surface water, sediment, and aquatic invertebrate tissue in a food chain model to calculate metal-specific estimated daily dose for comparison against avian and mammalian no-effect and low-effect TRVs. Aquatic plant tissue data are not available; therefore, the terrestrial plant data will be used to estimate the daily dose for the aquatic herbivores.

Assessment Endpoint #4: Maintain a stable and healthy terrestrial invertebrate community: Are the contaminant levels in soil high enough to affect survival, growth, or reproduction in the soil invertebrate communities?

Measurement Endpoints #4:

- Compare the metal levels in individual bulk soil samples to soil no-effect and low-effect ESVs.
- Compare invertebrate tissue data to published data linking tissue burden with toxicity.

Assessment Endpoint #5: Maintain a stable and healthy terrestrial plant community: Are the contaminant levels in soil high enough to affect survival, growth or reproduction in the terrestrial plant communities?

[2] A group of conspecific organisms occupying a defined area that has been selected to serve as an assessment endpoint entity for an ERA (Munns and Mitro, 2006).

Measurement Endpoint #5:

- Compare the metal levels in individual bulk soil samples to soil no-effect and low-effect ESVs.
- Compare plant tissue data to published data linking tissue burden with toxicity.

Assessment Endpoint #6: Maintain stable and healthy upland bird and mammal assessment populations: Are the contaminant levels in surface water, soil, and food items enough to affect survival, growth, or reproduction in upland birds and mammals?

Measurement Endpoint #6:

- Use metal levels measured in surface water, soil, plant tissue, small mammal tissue, and terrestrial invertebrate tissue in a food chain model to calculate metal-specific estimated daily dose for comparison against avian and mammalian no-effect and low-effect TRVs.

Assessment Endpoint #7: Support and contribute to a stable and healthy urban bird and mammal populations that may forage in the local parks (Bessemer Park, Stauter Field, Moynihan Park, Runyon Field, Benedict Park): Are the contaminant levels in soil and food items enough to affect survival, growth, or reproduction in upland birds and mammals represented by the American robin and deer mouse?

Measurement Endpoint #7:

- Use metal levels measured in soil, plant tissue, and terrestrial invertebrate tissue in a food chain model to calculate metal-specific estimated daily dose for comparison against avian and mammalian no-effect and low-effect TRVs.

6.0 BERA Risk Analysis Plan

The analysis phase examines two major parts of risk, exposure and effects, and their relationship with each other. The ecological exposure assessment involves the identification of potential exposure pathways and an evaluation of the magnitude of exposure to ecological receptors. Exposures will consider available data, ecological habitat, and if sample numbers are sufficient for a statistical representation of the exposure point concentration (EPC).

6.1 Exposure Analysis

6.1.1 Exposure Units

An exposure unit (EU) for terrestrial receptors (e.g., soil exposure) will be defined by the individual DUs. In other words, each DU will be evaluated for terrestrial risk individually. The average size of the 39 surficial soil DUs within the boundary of the Former Smelter is 0.6 - acres and the average size of the 89 surficial soil DUs within the site-wide ecological risk boundary is 1-acre. For ecological receptors, the actual area of exposure is determined by habitat preferences, home ranges, and feeding territories. To account for a receptor's home range exceeding the DU, area use factors (AUFs) will be applied. Section 5.1 and Table 6-1 provide a summary of the home ranges for aquatic and terrestrial wildlife receptors. Each municipal park will be considered as an individual EU.

The aquatic EUs as shown on Figures 5 and 8 include: 1) Runyon and Fountain Lakes SWA with an approximate area of 79 acres; 2) along the reach of the Arkansas River (including data from location SW011, upgradient seep SW020, SW008, SW009, and down reach below SW017) with an approximate area of 25 acres; 3) stormwater drainage ravine west of I-25 (SW010 and SW018) with an approximate area of 2 acres; and 4) the main OU2 onsite ravine, which channels City of Pueblo stormwater from the Bessemer neighborhood into the site and into the Arkansas River (from upgradient to downgradient: SW019, SW0006, SW012, SW005, SW016, SW007, and SW015) with an approximate area of 9 acres, which also receive groundwater from the site; 5,6,7 consist of minor ravines to the east which originate as seeps. Minor ravine, area 5, with SW013 and SW014 are located with an approximate area of 4 acres; minor ravine, area 6, where SW003 and SW004 are located with an approximate area of 3 acres; and minor ravine, area 7, is represented by SW002 with an approximate area of 3 acres. Note that surface water location SW001 has been filled in and is no longer an aquatic area.

6.1.2 Determination of Exposure Point Concentrations (Abiotic Media)

Soil – OU2 surficial soil sampling data (0-1, 1-6, 6-12, 12-18, and 18-24 inches) were obtained from the OU2 RI sampling (PWT, 2022a). Because the City of Pueblo performed an enforcement action in OU2, surface soil was reworked in certain areas in 2024. Surficial soil samples (0-1 and 1-6 inches) were re-collected from these areas, and this 2025 data will replace the 2022 data for the risk assessments. Additionally, OU1 soil sampling data (0-1, 1-6, 6-12, and 12-18 inches) were used from parks and other vacant spaces that have the potential to have ecological value will be considered in the BERA. For each DU and COPEC, the EPC will be represented by the ISM output. Each soil horizon will be evaluated separately to allow for risk managers to have the most flexibility in decision making; however, the assessment of the soil data collected from deeper than 6 inches will be presented in an appendix. Soil data collected from the 0-1-inch and 1-6-inch soil depths will be the primary exposure data in the BERA.

Sediment, Surface Water and Pore Water – If sufficient sample data are available from an EU (e.g., Runyon Lake, Arkansas River, drainages, or ravines) then a 95% upper confidence limit (UCL) can be calculated; otherwise, the maximum detection will be used as the EPC. Consideration should be given to temporal trends in the surface water and pore water data and if the most recently collected data are the "best" representative concentrations.

6.1.3 Determination of Exposure Point Concentrations (Biotic Media)

This BERA will incorporates the available environmental data collected from the Site, including biota sampling conducted in 2023 under Revision 3 of the Uniform Federal Policy Quality Assurance Project Plan (PWT, 2023). In lieu of modeling, tissue concentrations from terrestrial invertebrates, plants, aquatic invertebrates, mice and fish are available to use in the exposure model. Biota samples were analyzed for metals only, no organic constituents. **Appendix B** contains the tissue data.

Biota samples include:

- Fish from the Arkansas River (upstream and downstream), Runyon Lake, Fountain Lake (Appendix B1)
- Aquatic invertebrates – collected with sweep nets (Figure 8 and 9) (Appendix B2)
- Small mammal (mice) only collected from DU-0023 (Figure 9) (Appendix B3)
- Terrestrial invertebrates – collected with sweep nets (Figure 9) (Appendix B4)
- Plants (forbs, shrubs, grass) (Figure 9) (Appendix B5)

6.1.3.1 Fish

Table B1-1 in Appendix B lists the fish sample IDs, date collected, water body, fish species, and collection location. There are six fish tissue samples collected in the Arkansas River upstream of the site, four from downstream of the site in the Arkansas River, five samples collected from Fountain Lake, and 10 samples from Runyon Lake. Table B1-2 lists all fish tissue data (carcass, filet, and calculated total concentration) for the 25 samples. For use in the BERA, data should be organized by water body and the 95% UCL should be calculated if sufficient sample numbers are available. If sufficient sample numbers are not available for calculation of representative statistics, then the maximum detection should be used as the EPC. The method detection limit modified by half can be used if the COPEC was not detected in a sample. Beryllium, silver, and thallium were not detected in any of the fish tissue samples and antimony, cadmium and vanadium were detected at a low frequency. Table B1-3 presents the fish tissue data set.

Beryllium and thallium are not aquatic COPECs. Antimony and silver are COPECs in sediment but not surface water or pore water. Cadmium and vanadium are COPECs in sediment and onsite surface water. Fish were collected from off site in the Arkansas River, Runyon Lake, and Fountain Lake. An uncertainty analysis should be developed in the BERA that discusses the fish tissue samples collected from upstream as compared to the samples collected downstream of the site.

6.1.3.2 Aquatic Invertebrates

Aquatic invertebrates were collected in the Arkansas River and Runyon Lake in May 2023 and from the onsite ravines in May and August of 2023. Table B2-1 in Appendix B provides a summary of the sample data collected from the Arkansas River and Runyon Lake and Table B2-2 summarizes the onsite data. Table B2-3 lists the data from the Arkansas River and Runyon Lake, and Table B2-4 lists all the onsite data. The invertebrate data will be grouped as onsite or offsite and similar to the fish tissue data, and the 95% UCL will be calculated if sufficient samples are available; otherwise, the maximum detection or half the method detection limit (MDL) will be used in the BERA food web models.

There are no or low detections of antimony, beryllium, silver, and thallium in the aquatic invertebrate samples. Beryllium and thallium are not aquatic COPECs. Antimony and silver are COPECs in sediment but not surface water or pore water.

6.1.3.3 Small Mammals

Small mammals (mice) were only collected from DU-0023 (Figure 9). Data are summarized on Table B3-1, and the complete data set is shown on Table B3-2 Appendix B. There are five unique samples. Antimony, beryllium, silver, thallium, and vanadium were not detected in any sample.

Because mice were collected from only one DU (DU-0023), the tissue data is only relevant for the nearby Dus. including DU-0026, 25, 131, 130, 28, 21, and 22. For these DUs, the 95% UCL will be used, as the EPC if ProUCL calculates the value, the maximum detection, or half the MDL for antimony, beryllium, silver, thallium and vanadium. Cadmium, cobalt, and selenium were detected in one sample; therefore, the one detected concentration will be used.

For all the other DUs, the small mammal tissue will be modeled using the methodology described in the Eco SSL documents for these metals. Attachment 4-1 (Table 4a) from USEPA's 2007 Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs) provides the methodology to be used to estimate small mammal tissue concentrations (EPA, 2007c).

6.1.3.4 Terrestrial Invertebrates and Plants

Terrestrial invertebrates were collected using sweep nets. The terrestrial invertebrate community is primarily represented by grasshoppers. As shown on Figure 9, these samples were collected from multiple DUs (3,5, 9, 19, 38, 47, 85, 96, 109, 122, 128 and 131).

Forbs, shrubs, and grasses were sampled concurrently with terrestrial invertebrates in August 2023. Sample data is summarized on Table B4-1, and Table B4-2 presents the data by DU and sample ID. Note that within the sample ID, forbs are designated with -01, shrubs with -02, and grasses with -03.

Because samples of terrestrial invertebrates and plants were collected throughout the site, but not from every DU, data collected from a DU will be applied to the surrounding DUs.

- Terrestrial invertebrates and plants were collected from DU-0109 in the southeast corner of the OU1 boundary. These data will be applied to the surrounding DUs in the area (DU-0098 through DU-0118). There is only one sample to represent this area; therefore, the detection or half the MDL will be used as the EPC.
- Terrestrial invertebrates and plants were collected from DU-0096 along the southern edge of Fountain Lake. These data will be applied to the DUs along the southern edge of Runyon and Fountain Lake, whereas the sample data from DU-0122 will be applied to the northern edge and halfway down the western edge.
- Terrestrial invertebrates and plants data from DU-0085 will be applied to DU-0082 and DU-0083.
- Terrestrial invertebrates and plants data from DU-0038 will be applied to DU-0037, 39, 40, and 44.
- Terrestrial invertebrates and plants data from DU-0047 will be applied to DU-0043, 44, 45, 46, 48, and 49.
- Terrestrial invertebrates and plant data collected along the ravine will be applied to the remaining DUs. There are seven samples of terrestrial invertebrates and plant data collected along the ravine; therefore, a 95% UCL can be calculated.

6.1.4 Exposure Parameters

Exposure of aquatic receptors, plants and soil organisms will be evaluated based on the concentrations of a COPEC in the water or soil, where these receptors are living, so exposure factors are not needed for these groups.

Exposures of birds and mammals will be characterized in terms of the total ingested dose from each contaminated environmental media (e.g., soil, food and water) in accord with the following general equation:

$$\text{Daily Dose (mg/kg bw-day)} = ((FIR \times Cfood) + (WIR \times Cwater) + SIR \times Csoil)) \times AUF$$

where:

FIR = food ingestion rate (kg food dw/kg bw-day)

Cfood = concentration in the overall diet (mg/kg food dw)

WIR = water ingestion rate (L water/kg bw-day)

Cwater = concentration in water (mg/L water)

SIR = sediment or soil ingestion rate (kg sediment dw/kg bw-day)

Csoil = concentration in sediment or soil (mg/kg dw)

AUF = area use factor (unitless); fraction of time that a receptor spends at the exposure area relative to the entire home range.

The AUF, which represents the fraction of a receptor species' home range covered by the area of an EU, will be set at 1.0 in all exposure equations initially. Assuming an AUF of 1.0 can be conservative, because it indicates that the entire daily dose ingested by a wildlife receptor is obtained entirely within a particular EU, which may be unrealistic. Note that the American robin and deer mouse both have home ranges at 1 acre or less, which will likely result in no adjustment for home range, as most DUs are 1 acre or less. For receptors like the red-tailed hawk, red fox, and mule deer, their home ranges exceed the size of OU2 and the AUF will be applied.

If there are multiple types of foods consumed by the receptor, the portion of the dose derived from the diet incorporates the proportion of each prey type within a typical diet for that receptor. This is done by weighting the COPEC concentration in each component of the diet by the fraction of the total diet consisting of that prey type. Water ingestion will be incorporated into the wildlife exposure by applying representative surface water concentrations from the onsite ravine samples for onsite exposure and from the Arkansas River/Runyon Lake data set for exposures around the Arkansas River/Runyon Lake area.

The exposure parameters selected for each wildlife receptor surrogate identified for evaluation in the BERA are detailed in Table 6-1 for the aquatic receptors and Table 6-2 for the terrestrial receptors. Table 6-3 lists the dietary components for each of the wildlife receptors.

6.2 Effects Assessment

The effects assessment is the second part of the analysis phase of the BERA. It includes identification and development of ecological toxicity criteria, or toxicity reference values (TRVs), representing threshold concentrations or doses for adverse effects for each relevant environmental medium, COPEC, and ecological receptor.

Ecological TRVs are chemical-specific estimates of exposure that identify an exposure level that is believed to be without any risk of effect (no observed effect concentration [NOEC] or no observed adverse effect level [NOAEL]) or identify the lowest exposure level that may cause an adverse effect (lowest observed effect concentration [LOEC] or lowest observed adverse effect level [LOAEL]). Both types of these TRVs will be used in the BERA. Three different types of TRVs will be used in the BERA:

- Concentration-based TRVs are expressed as a concentration of a chemical in abiotic media. These will be used when evaluating risks to receptors that have direct contact with contaminated medium (e.g., fish in water, plants in soil) and are expressed in units of mg/unit medium.
- Dose-based TRVs are expressed as an ingested dose. These will be used to estimate exposure of individual wildlife via ingestion and are expressed in units of mg/kg-day.

- Tissue-based TRVs are expressed in units of mg/kg tissue in the exposed receptor. This type of TRV is often referred to as critical tissue residue (CTR). Most CTRs that are applicable to ERA are expressed as whole-body tissue concentrations. Section 2.3.5 describes the methodology used to derive the whole-body tissue concentrations from the fillet and offal samples collected for this BERA. Fish tissue concentrations are shown in Appendix B-1.

Application of these TRVs to estimate ecological risks within the BERA is described in further detail below.

6.2.1 Concentration-Based TRVs

Concentration-based TRVs will be used in the BERA to evaluate direct exposures of aquatic and terrestrial receptors to surface water, sediment, and soils at the Site.

Surface Water TRVs for Aquatic Receptors

Surface water benchmark values for the protection of aquatic life from direct contact with contaminants in surface water are available from several sources, as described in Appendix C of the SLERA. Appendix C shows the rescreening of the surface water and pore water data with samples collected since finalization of the SLERA. Aluminum, cadmium, chromium, copper, lead, manganese, nickel, silver, and zinc concentrations were screened using hardness dependent benchmarks, as defined by 5 CCR 1002-32, TVS. Surface water sampling locations are broken out between onsite ravines, which have an average hardness of 1,279 mg/L; however, the maximum default value used is 400 mg/L, and Arkansas River and Runyon Lake used an average hardness of 200 mg/L. Note that the calculation for aluminum uses a hardness no greater than 220 mg/L.

Sediment TRVs for Benthic Macroinvertebrates

Sediment toxicity benchmark values for the protection of benthic macroinvertebrate communities are available from several sources as described in Appendix C of the SLERA. In brief, two types of sediment benchmarks will be used in the BERA to evaluate exposure and risk to benthic invertebrates:

- Threshold effect concentration (TEC)
- Probable effect concentration (PEC)

Sediment toxicity is expected to be absent or minimal at concentrations below the TEC (a NOEC-equivalent benchmark), while effects are predicted to occur at concentrations above the PEC (a LOEC-equivalent benchmark). Exposures at a concentration between the TEC and the PEC may result in some effects, but it is considered likely the effects will be of relatively low ecological significance.

Soil TRVs for Terrestrial Plants and Soil Invertebrates

Toxicity benchmark values for the protection of terrestrial plants and soil invertebrates from direct contact with soil are available from several sources, as described in Appendix C of the SLERA. In general, values are based on the USEPA-recommended Ecological Soil Screening Levels (EcoSSLs) where available and otherwise based on Oak Ridge National Laboratory (ORNL) Benchmark values. Another resource to be considered is the LANL ECORISK database to develop soil benchmarks based on low effect (LOEC) levels. The assessment of risk to the community receptors (plants and invertebrates) in the BERA should evaluate both no-effect and low-effect toxicity data for risk managers the range of risks.

6.2.2 Dose-Based TRVs

In general, wildlife TRVs used in the BERA will be selected to represent relevant toxicity endpoints for population sustainability (growth, reproduction, and survival). Both NOAEL and LOAEL values will be used. Table 6-4 lists the NOAELs and LOAELs for the inorganic COPECs for birds and mammals. The hierarchy of TRVs is

1. Bounded NOAELs and LOAELs from the EcoSSLs documents.
2. If a bounded LOAEL is not available, the LOAEL was chosen from a critically evaluated study presented in the EcoSSLs document based on reproduction or growth endpoints.

Note that TRVs are not listed for iron, although iron is considered a COPEC in surface water and pore water. An assessment of iron will be completed qualitatively and discussed in the uncertainty section of the BERA.

6.2.3 Tissue-Based TRVs

Tissue data collected at the Site are metals in terrestrial invertebrates, plants, small mammals, fish, and aquatic invertebrates. The USEPA has not yet established standard tissue-based benchmarks for use in ERA, but some values can be identified from published literature. One resource that will be used for identification of tissue-based benchmarks in fish for the BERA is the Environmental Residue-Effects Database (ERED). This database was developed and is maintained by the U.S. Army Engineer Research and Development Center and includes a collection of residue-effects data obtained from peer reviewed literature and reports submitted by U.S. government agencies. These CTR values could be used in BERA to compare predicted whole-body fish tissue concentrations derived from the available fillet data. Because of the significant uncertainties in this assessment, it will be considered qualitative.

7.0 BERA Risk Characterization

Risk characterization combines potential site-related exposures and the potential for ecotoxicological effects to estimate the likelihood of ecological risks. The risk characterization is conducted for each COPEC and receptor scenario to evaluate potential effects for each assessment endpoint.

7.1 Community Receptors

For evaluation of direct contact exposures by aquatic and terrestrial communities, hazard quotient (HQ) values will be calculated by comparing COPEC concentrations in individual samples to appropriate NOEC and LOEC benchmark concentrations.

7.2 Avian and Mammalian Wildlife

Risk is expressed as the ratio of EPC (or Dose) divided by the TRV (in comparable units), otherwise known as a HQ. HQs are calculated using the following equation:

where:

$$HQ = \frac{EPC\ (or\ Dose)}{TRV}$$

HQ = hazard quotient (unitless)

EPC = exposure point concentration (mass/mass or mass/volume)

Dose = average daily dose (mg/kg)

TRV = toxicity reference value (same units as EPC or Dose)

If the HQ is less than one, then it is concluded that the potential for impacts to ecological receptors is absent or minimal. If the HQ is equal to or greater than one, then it is concluded that a potential for impacts to ecological receptors exists. When the TRV is based on a NOAEL-or LOAEL-approach, the magnitude of the risk cannot be characterized in terms of the magnitude of the probability of an adverse effect.

HQs will be calculated on a DU-by-DU basis and evaluated by consideration of the frequency and magnitude of HQ values that equal or exceed 1. The fraction of the population that must have HQ values below a value of 1 in order for the population to remain stable depends on the species being evaluated and on the toxicological endpoint underlying the toxicity benchmark. Consequently, reliable characterization of the impact of a chemical stressor on an exposed population's risks requires knowledge of population size, birth rates, and death rates, as well as immigration and emigration rates. Because this type of detailed knowledge of population dynamics is generally not available on a site-specific basis, extrapolation from a distribution of individual risks to a characterization of population-level risks is generally uncertain. However, if all or nearly all the HQs for individuals in a population of receptors are below 1, it is very unlikely that adverse population level effects will occur in the exposed population. Conversely, if many or all the individual receptors have HQs that are above 1, then adverse effects on the exposed population are likely, especially if the HQ values are large. If only a small portion of the exposed population has HQ values that exceed 1, some individuals may be impacted, but population-level effects are not likely to occur. As the fraction of the population with HQ values above 1

increase, and as the magnitude of the exceedances increases, risk that a population-level effect will occur also increases.

8.0 Uncertainty Analysis

Uncertainty is inherent in a BERA because numerous assumptions need to be made to proceed with the assessment. The process of evaluating ecological risks involves multiple steps, each with inherent uncertainties. Uncertainties may exist, for example, in the environmental chemistry sampling and analysis used to conduct the risk assessment, the exposure parameters and assumptions, the toxicological information used, and the quantitative risk characterization.

These uncertainties should be considered in the development of risk management decisions. Each of the main sources of uncertainty will be evaluated in the final uncertainty analysis of the BERA. Consideration will be given, but is not limited to, the following topics:

- Uncertainties in use of a surrogate chemical's chemical properties, bioaccumulation potential or toxicity information.
- Uncertainties with the selection of hypothetical receptors and potential exposure pathways.
- Uncertainties with measured and modeled concentrations in biota (e.g., bioaccumulation factors, regression equations).
- Uncertainties associated with sampling and analytical limitations inherent in the site characterization. Uncertainties arise from the limits on the number of locations that can be sampled.
- Uncertainties associated with wildlife exposure parameters and the quantification of the daily dose.
- Uncertainties in receptor area use factors, home ranges, and sizes of foraging areas.

8.1 Groundwater to Surface Water Pathway

Although this pathway is considered potentially complete based on the data collected to date, surface water and pore water will be used in the BERA for assessment of this pathway. Within the OU2 ravine the interaction between shallow groundwater and surface water was observed based on the results of thermal imaging, thermal sediment profiling, logging of temperature and conductivity in surface water, and logging of temperature gradients in saturated sediment (USEPA, 2022).

Groundwater that is hydrologically connected to a surface stream and has the ability to influence the amount or direction of flow of water in that stream is referred to as tributary. In Colorado, all groundwater is presumed to be tributary to a surface stream. Groundwater has only been evaluated within the OU2 Site. Groundwater flows toward the north, principally along the OU2 ravine until impounded against the south wall of the Arkansas River levee, where the flow is then directed to the northeast toward the Arkansas River. Groundwater level measurements within the wetland of the OU2 ravine show that the water table is above the ground surface. Depth to groundwater is shallow to the south and north of the wetland in the OU2 ravine, less than 3 feet below ground level, until groundwater flows into the northern open where the depth increases to approximately 10 feet below ground level.

Surface water in the OU2 ravine originates from a storm drain at West Arroyo Avenue, flows through a culvert under I-25 into the Site, and flows north along the base of the ravine, at which point the surface water enters a storm drain, which then goes under South Santa Fe Avenue and enters into the Arkansas

River east of Santa Fe Avenue and west (upstream) of the pedestrian bridge that crosses the Arkansas River on the Arkansas River Trail (PWT, 2023b).

The impact of the uncertainty that the groundwater-to-surface water pathway was not evaluated using the groundwater data is minimized by the multiple sampling events of surface water, pore water, and sediment; however, the impact to plant roots remains uncertain.

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Tables

Table 3-2.
Summary of Chromium and Hexavalent Chromium Data

Location	Top Sample Depth (inches)	Bottom Sample Depth (Inches)	Total Chromium (mg/kg)	Hexavalent Chromium (mg/kg)	% of Hexavalent Chromium
DU-0001	0	1	13	3.27	25.20%
DU-0001	1	6	6.6	1.16	17.60%
DU-0001	6	12	5.5	0.575	10.50%
DU-0001	12	18	5.9	0.219	3.70%
DU-0001	18	24	6.3	0.195	3.10%
DU-0002	0	1	17	0.51	3.00%
DU-0002	1	6	15	0.04	0.30%
DU-0002	6	12	7.2	0.14	1.90%
DU-0002	12	18	6.5	0.02	0.30%
DU-0002	18	24	4.6	0.051	1.10%
DU-0003	0	1	17	0.346	2.00%
DU-0003	1	6	9.1	0.467	5.10%
DU-0003	6	12	8.5	0.129	1.50%
DU-0003	12	18	6.9	0.014	0.20%
DU-0003	18	24	8.8	0.212	2.40%
DU-0004	6	12	5	0.05	1.00%
DU-0005	12	18	4.3	0.046	1.10%
DU-0005	18	24	4.8	0.015	0.30%
DU-0006	1	6	9.6	0.035	1.30%
DU-0006	6	12	5.1	0.124	2.40%
DU-0006	12	18	4.3	0.119	2.80%
DU-0006	18	24	4.9	0.024	0.50%
DU-0007	1	6	5.9	0.036	0.60%
DU-0007	6	12	5.2	0.157	3.00%
DU-0007	12	18	5.2	0.289	5.60%
DU-0007	18	24	5.1	0.112	2.20%
DU-0008	1	6	3.5	0.088	2.50%
DU-0008	6	12	6.4	0.04	0.60%
DU-0008	12	18	5.5	0.273	5.00%
DU-0008	18	24	6.1	0.199	3.30%
DU-0009	6	12	7.97	0.026	0.30%
DU-0009	12	18	7.33	0.097	1.30%
DU-0009	18	24	7.67	0.079	1.00%
DU-0012	0	1	3.4	0.086	2.50%
DU-0012	1	1	3.4	0.086	2.50%
DU-0012	1	6	3.8	0.027	0.70%
DU-0012	6	12	8.2	0.015	0.20%
DU-0014	0	1	18.1	0.554	3.10%
DU-0014	1	6	14.3	0.4	2.80%
DU-0014	6	12	9	0.392	4.40%
DU-0014	12	18	9.3	0.26	2.80%

Table 3-2.
Summary of Chromium and Hexavalent Chromium Data

Location	Top Sample Depth (inches)	Bottom Sample Depth (Inches)	Total Chromium (mg/kg)	Hexavalent Chromium (mg/kg)	% of Hexavalent Chromium
DU-0015	6	12	9.3	0.079	0.80%
DU-0015	12	18	8.1	0.097	1.20%
DU-0015	18	24	8.3	0.077	0.90%
DU-0016	1	6	15.5	0.069	0.40%
DU-0016	12	18	9.4	0.018	0.20%
DU-0016	18	24	9.5	0.089	0.90%
DU-0017	1	6	13	0.019	0.10%
DU-0017	6	12	46.9	0.019	0.04%
DU-0018	6	12	10.3	0.048	0.50%
DU-0018	12	18	8.5	0.083	1.00%
DU-0019	6	12	7.3	0.03	0.40%
DU-0019	12	18	6.6	0.08	1.20%
DU-0019	18	24	6	0.067	1.10%
DU-0020	1	6	11	0.013	0.10%
DU-0020	6	12	5.7	0.027	0.50%
DU-0021	1	6	11	0.033	0.30%
DU-0021	6	12	8.5	0.061	0.70%
DU-0021	12	18	8.1	0.011	0.10%
DU-0021	18	24	7.5	0.014	0.20%
DU-0022	1	6	11	0.017	0.20%
DU-0022	6	12	7	0.025	0.40%
DU-0022	12	18	8	0.053	0.70%
DU-0022	18	24	6	0.074	1.20%
DU-0023	6	12	6.3	0.022	0.30%
DU-0023	12	18	5.8	0.079	1.40%
DU-0023	18	24	5.5	0.209	3.80%
DU-0025	18	24	4.5	0.011	0.20%
DU-0026	6	12	7.1	0.0397	0.60%
DU-0026	12	18	6.03	0.091	1.50%
DU-0026	18	24	27.1	0.107	0.40%
DU-0028	0	1	19.8	0.44	2.20%
DU-0028	1	6	17.1	0.325	1.90%
DU-0028	6	12	10.1	0.26	2.60%
DU-0028	12	18	8.9	0.171	1.90%
DU-0028	18	24	8	0.149	1.90%
DU-0029	0	1	27.8	0.557	2.00%
DU-0029	1	6	20.6	0.886	4.30%
DU-0029	6	12	9.3	0.297	3.20%
DU-0029	12	18	8.9	0.345	3.90%
DU-0029	18	24	7.1	0.142	2.00%
DU-0030	0	1	23.1	0.579	2.50%

Table 3-2.
Summary of Chromium and Hexavalent Chromium Data

Location	Top Sample Depth (inches)	Bottom Sample Depth (Inches)	Total Chromium (mg/kg)	Hexavalent Chromium (mg/kg)	% of Hexavalent Chromium
DU-0030	1	6	17.6	0.221	1.30%
DU-0030	6	12	4.9	0.156	3.20%
DU-0030	12	18	7.3	0.172	2.40%
DU-0030	18	24	8.2	0.252	3.10%
DU-0031	0	1	137	3.26	2.40%
DU-0031	1	6	96.1	1.46	1.50%
DU-0031	6	12	26	0.642	2.50%
DU-0031	12	18	10.6	0.083	0.80%
DU-0031	18	24	8.8	0.55	6.30%
DU-0032	1	6	33.3	0.067	0.20%
DU-0032	6	12	27.9	0.087	0.30%
DU-0032	12	18	33.1	0.014	0.04%
DU-0032	18	24	11.9	0.102	0.90%
DU-0033	0	1	19.9	0.497	2.50%
DU-0033	1	6	25.7	0.716	2.80%
DU-0033	6	12	13.3	0.182	1.40%
DU-0033	12	18	13.1	0.298	2.30%
DU-0033	18	24	6.2	0.147	2.40%
DU-0034	0	1	48.8	0.237	0.50%
DU-0034	1	6	26.4	0.554	2.10%
DU-0034	6	12	15.7	0.669	4.30%
DU-0034	12	18	9	0.232	2.60%
DU-0034	18	24	10.3	0.082	0.80%
DU-0035	0	1	30.6	0.23	0.80%
DU-0035	1	6	17.9	0.267	1.50%
DU-0035	6	12	16.7	0.419	2.50%
DU-0035	12	18	12.1	0.695	5.70%
DU-0035	18	24	7.9	0.233	2.90%
DU-0036	0	1	34.2	0.039	0.10%
DU-0036	1	6	36.2	0.196	0.50%
DU-0036	6	12	6.2	0.289	4.70%
DU-0036	12	18	8.5	0.163	1.90%
DU-0036	18	24	8.5	0.326	3.80%
DU-0130	6	12	6.9	0.022	0.30%
DU-0130	12	18	8.5	0.053	0.60%
DU-0130	18	24	5.6	0.088	1.60%
DU-0131	18	24	5.2	0.018	0.30%

Notes:
DU: Decision Units
mg/kg: miligrams per kilogram
%: Percent

Table 5-1.
Summary of BERA Ecological Receptors

Receptor Class	Exposure Area(s)	Representative Species	Primary Dietary Components	Direct Media Exposure	Toxicity Values
Aquatic Water Column Communities	Arkansas River, Runyon Lake, & Ravines	Water Column community	--	Surface Water	Water Quality Criteria
Aquatic Invertebrate Community	Arkansas River, Runyon Lake, & Ravines	Benthic community	--	Sediment, Pore Water	Media based screening levels
Fish community	Arkansas River & Runyon Lake	Fish community	--	Surface Water	Water Quality Criteria and body burden data
Herbivorous Aquatic Birds	Arkansas River & Runyon Lake	Mallard duck	Vegetation	Sediment, Surface Water	Wildlife TRVs
Insectvorous Aquatic Birds	Arkansas River & Ravines	American Dipper	Aquatic Invertebrates/Fish	Sediment, Surface Water	Wildlife TRVs
Piscivorous Aquatic Birds	Arkansas River & Runyon Lake	Belted Kingfisher	Fish	Sediment, Surface Water	Wildlife TRVs
Herbivorous Aquatic Mammals	Arkansas River & Runyon Lake	Muskrat	Vegetation	Sediment, Surface Water	Wildlife TRVs
Omnivorous Aquatic Mammals	Arkansas River, Runyon Lake, Ravines	Raccoon	Aquatic Invertebrates/Fish/Vegetation	Sediment, Surface Water	Wildlife TRVs
Omnivorous Wetland Birds	Ravines, Wetlands	Red-winged blackbird	Terrestrial Invertebrates/Vegetation	Sediment, Surface Water	Wildlife TRVs
Insectivorous Wetland Birds	Ravines, Wetlands	Marsh wren	Terrestrial invertebrates	Sediment, Surface Water	Wildlife TRVs
Omnivorous Wetland Mammals	Ravines, Wetlands	Meadow vole	Vegetation/Terretrial Invertebrates	Soil, Surface Water	Wildlife TRVs
Terrestrial Plant Community	Terrestrial DUs	Terrestrial plant community	--	Soil	Media based screening levels
Terrestrial Invertebrate Community	Terrestrial DUs	Terrestrial invertebrate community	--	Soil	Media based screening levels
Herbivorous Terrestrial Birds	Terrestrial DUs	Mourning Dove	Vegetation	Soil, Surface Water	Wildlife TRVs
Omnivorous Terrestrial Birds	Terrestrial DUs	American Robin	Terrestrial Invertebrates/Vegetation	Soil, Surface Water	Wildlife TRVs
Carnivorous Terrestrial Birds	Terrestrial DUs	Red-tailed Hawk	Small mammals	Soil, Surface Water	Wildlife TRVs
Herbivorous Terrestrial Mammals	Terrestrial DUs	Mule deer	Vegetation	Soil, Surface Water	Wildlife TRVs
Omnivorous Terrestrial Mammals	Terrestrial DUs	Deer mouse	Vegetation/Terrestrial Invertebrates	Soil, Surface Water	Wildlife TRVs
Carnivorous Terrestrial Mammals	Terrestrial DUs	Red fox	Small mammals	Soil, Surface Water	Wildlife TRVs

Notes:
Wildlife exposure parameters are presented on Tables 6-1 and 6-2.
Wildlife TRVs (NOAELs and LOAELs) presented on Table 6-3.
Primary dietary components are represented in the BERA exposoure model and do not include a full listing of all possible dietary components.
DU: Decision units
TRVs: Toxicity reference values

Table 6-1
Ecological Receptors Exposure Parameters - Aquatic and Riparian/Wetland

Receptor	Food Ingestion Rate (kg/day)		Body Weight (kg)		Sediment in Diet (%)		Sediment Ingestion rate (kg/day)	Water Ingestion Rate (L/day)		Home Range (acres)	
Mallard Duck	0.0797	a	1.15	b	3.3	c	0.0026	0.065	d	1074	e
Red Winged Blackbird	0.0093	a	0.05	b	2	c	0.0002	0.008	d	6.9	e
American Dipper	0.0118	a	0.055	b	3.3	c	0.0004	0.008	d	3	e
Belted Kingfisher	0.0234	a	0.148	b	2	c	0.0005	0.016	d	3.11	e
Marsh Wren	0.0026	a	0.0119	b	7.3	c	0.0002	0.003	d	0.13	e
Muskrat	0.0527	a	1.17	b	13	c	0.0068	0.114	d	0.33	e
Meadow Vole	0.0083	a	0.037	b	2.4	c	0.0002	0.005	d	0.07	e
Raccoon	0.1937	a	5.411	b	9.4	c	0.0182	0.452	d	96	e

Notes:
kg = killograms
kg/day = killograms per day
% = percent
L/day = liter per day

a Food Ingestion Rates

Mallard - Based on Nagy (2001) for all birds.
Red Winged Blackbird - Estimated using allometric equation for all birds from Nagy (2001) due to the lack of data for herbivorous birds.
American Dipper - Averaged food ingestion measured by Morrissey et al., 2005.
Belted Kingfisher - Based on Nagy (2001) for carnivorous birds.
Marsh Wren - Emperical value reported in USEPA (1993).
Muskrat - Arithmetic mean of two empirical values (Svihla and Svihla 1931, USEPA 1993).
Meadow vole - Based on Nagy (2001) for herbivorous mammals.
Raccoon - Based on Nagy (2001) for all mammals.

b Body Weights

Mallard - Average of adult body weights listed above from Nelson and Martin (1953), USEPA (1993), and Whyte and Bolen (1984).
Red Winged Blackbird - Arithmetic mean of literature values from Gough (2003).
American Dipper - Average weight as reported by birdful.org and Morrissey et al 2005
Belted Kingfisher - Average adult weight from Brooks and Davis (1987).
Marsh Wren - Mean reported in USEPA (1993)
Muskrat - Arithmetic mean for adult body weights from USEPA (1993).
Meadow vole - Reported in USEPA (1993).
Raccoon - Arithmetic mean of body weights listed from USEPA (1993).

c Sediment in Diet

Mallard - Based on Beyer et al. 1994.
Red Winged Blackbird - Assume 2%
American Dipper - Prefer stream habitats with bottoms composed of rocks, sand and rubble, assume 3.3% based on Beyer et al. 1994.
Belted Kingfisher - Assmed 2% based on blue-wing teal as surrogate (Beyer et al. 1994). Although primarily piscivorous, some invertebrates are ingested and soil is likely ingested during nest construction (Cornwell 1963)
Marsh Wren - Least sandpiper used as surrogate based on similarity in diet and foraging behavior.
Muskrat - Assumed based on shrew soil intake (Sample & Suter, 1994)
Meadow vole - Based on Beyer et al. 1994.
Raccoon - Based on Beyer et al. 1994.

Table 6-1
Ecological Receptors Exposure Parameters - Aquatic and Riparian/Wetland

d Water Ingestion Rates

All Birds - Calculated using equation for birds from Calder and Braun (1983).

Water Ingestion (L/day) = 0.059 $BW^{0.67}$ (kg)

All Mammals - Calculated using allometric equation for mammals from Calder and Braun (1983).

Water Ingestion (L/day) = 0.099 $BW^{0.90}$ (kg)

e Home Range/Forage Range

Mallard - Average of four home ranges listed above from Dwyer et al. (1979), Kirby et al. (1985) and USEPA (1993).

Red Winged Blackbird - Mean range reported in Odum and Kuenzler (1955)

American Dipper - Assumed to be similar to the Belted Kingfisher foraging range.

Belted Kingfisher - Average of four literature values (Brooks and Davis 1987, Davis 1982).

Marsh Wren - Arithmetic mean of values provided above from Kale (1965), Verner (1965) and Leonard and Picman (1986).

Muskrat - Arithmetic mean of five literature values from USEPA (1993).

Meadow vole - Average of summer and winter values presented in USEPA (1993).

Raccoon - Lowest mean value for year round home range listed in USEPA (1993).

Table 6-2
Ecological Receptors Exposure Parameters - Terrestrial Areas

Receptor	Food Ingestion Rate (kg/day)		Body Weight (kg)		Soil in Diet (%)		Soil Ingestion rate (kg/day)	Water Ingestion Rate (L/day)		Home Range (acres)	
Mourning Dove	0.0296	a	0.21	b	9.3	c	0.0028	0.021	d	40	e
American Robin	0.0119	a	0.079	b	10.4	c	0.0012	0.011	d	1	e
Red Tailed Hawk	0.0359	a	1.138	b	0	c	0.0000	0.064	d	1722	e
Mule Deer	1.4673	a	67	b	1	c	0.0147	4.356	d	705	e
Deer Mouse	0.0037	a	0.018	b	2	c	0.0001	0.003	d	0.04	e
Red Fox	0.1350	a	4.535	b	2.8	c	0.0038	0.386	d	2564	e

Notes:
kg = killograms
kg/day = killograms per liter
% = percent
L/day = liter per day

a Food Ingestion Rates (dry weight)

Mourning Dove - Based on Nagy (2001) for all birds.

American Robin - Based on Nagy (2001) for insectivorous birds.

Red Tailed Hawk - Average of three empirical values from Craighead and Craighead (1956) as reported by USEPA (1993),

Mule Deer - Average empirical values for deer in Colorado (Alldredge et al. 1974).

Deer Mouse - Average of emperical values from Cronin and Bradley (1988) and Nelson and Desjardins (1987).

Red Fox - Average of four empirical values from Sargeant (1978) and Vogtsberger and Barrett (1973).

b Body Weights

Mourning Dove - Average adult body weight (Sibley 2000).

American Robin - Wheelwright, 1986 as cited in USEPA (1993)

Red Tailed Hawk - Average of adults based on four values from Steenhof (1983) and Springer and Osborne (1983) in USEPA 1993.

Mule Deer - Average adule and female body weights from Mackiet et al. (1982).

Deer Mouse - Average of adult values from Miller (1989) and Fordham (1971).

Red Fox - Average of four adult body weights listed above (Storm et al. 1976, USEPA 1993).

c Soil in Diet

Mourning Dove - Wild turkey used as surrogate based on ground-feeding behavior.

American Robin - Beyer et al. 1994, assumed to be similar to American woodcock.

Red Tailed Hawk - Assumed to be minimal (Sample & Suter, 1994)

Mule Deer - Average of empirical values reported by Arthur and Alldredge (1979).

Deer Mouse - White-footed mouse used as surrogate (Beyer et al. 1994).

Red Fox - Based on Beyer et al. 1994.

d Water Ingestion Rates

All Birds - Calculated using equation for birds from Calder and Braun (1983).

$$\text{Water Ingestion (L/day)} = 0.059\ BW^{0.67}\ \text{(kg)}$$

All Mammals - Calculated using allometric equation for mammals from Calder and Braun (1983).

$$\text{Water Ingestion (L/day)} = 0.099\ BW^{0.90}\ \text{(kg)}$$

Table 6-2
Ecological Receptors Exposure Parameters - Terrestrial Areas

e **Home Range/Forage Range**

Mourning Dove - Personal communication with dove hunters (TCEQ, 2024).

American Robin - Based on Pitts (1984)

Red Tailed Hawk - Average of empirical values from Craighead & Craighead (1956) for fields and woods in Michigan. Home range in upland prairie habitats may be larger (e.g., 2,000-6,000 acres; Andersen et al. 1989). The 210-acre value from Fitch et al. (1946) was estimated by the authors based on perch and foraging territory.

Mule Deer - Anderson and Wallmo (1984).

Deer Mouse - Average of values presented in EPA (1993), for summer and winter, males and females.

Red Fox - Average home range of adults during all seasons in Jones and Theberge, 1993; Sargeant, 1972; Ables, 1969 (USEPA 1993)

Table 6-3
Ecological Receptors Dietary Composition

Receptor	Habitat	Dietary Composition (%)					Source
		Plants	Terrestrial Inverts	Small Mammals	Fish	Aquatic Inverts	
Mourning Dove	Terrestrial	100	--	--	--	--	Martin 1951, Bent 1932
American Robin	Terrestrial	28	72	--	--	--	EPA 1993
Red Tailed Hawk	Terrestrial	--	--	100	--	--	EPA 1993
Mule Deer	Terrestrial	100	--	--	--	--	Short 1977, Bartmann et al 1982
Deer Mouse	Terrestrial	60	40	--	--	--	Flake 1973, Whitaker 1966
Red Fox	Terrestrial	20	5	75	--	--	EPA 1993
Red Winged Blackbird	Wetland*	90	10	--	--	--	Meanley 1961
Marsh Wren	Wetland*	--	100	--	--	--	EPA 1993
Meadow Vole	Wetland*	95	5	--	--	--	EPA 1993
Mallard Duck	Aquatic	70	--	--	--	30	EPA 1993
Belted Kingfisher	Aquatic	--	--	--	85	15	Davis 1982
American Dipper	Aquatic	--	--	--	--	100	Terres 1980
Muskrat	Aquatic	100	--	--	--	--	EPA 1993
Raccoon	Aquatic	--	--	--	10	90	EPA 1993

Wetland receptors may be evaluated with a mix of soil, sediment, terrestrial invertebrates and aquatic invertebrates. For example, marsh wrens generally live and breed in wetland areas with standing water, and forage heavily on aquatic invertebrates, aquatic insects and spiders. The extent to which they feed on terrestrial vs aquatic invertebrates depends on season and life stage; hatchlings are fed mostly aquatic and benthic invertebrates until fledging (USEPA 1993).

Table 6-4
Toxicity Reference Values for Wildlife

COPEC	Avian NOAELTRV (mg/kg-day)		Avian LOAELTRV (mg/kg-day)		Mammal NOAELTRV (mg/kg-day)		Mammal LOAEL TRV (mg/kg-day)	
Aluminum	110	No reproductive effects at 1000 ppm dietary exposure. Value used in LANL (2024) Carriere et al 1986.	1100	Derived using factor of 10 applied to NOAEL. Value used in LANL (2024).	1.93	Derived using factor of 10 applied to LOAEL. Value used in LANL (2024).	19.3	Growth endpoint (Ondreicka et al 1966) as reported in LANL 2024
Antimony	NA	No data available	--	No data available	0.059	Eco SSL NOAEL	0.59	Eco SSL Bounded LOAEL
Arsenic	2.24	Eco SSL NOAEL	17.30	Growth endpoint (Hoffman et al, 1992) as reported in EcoSSL	1.04	Eco SSL NOAEL	1.66	Eco SSL Bounded LOAEL
Barium	73.5	Geometric mean, 3 studies, endpoints are survival and development (LANL, 2024)	131	Geometric mean of LOAELs from LANL (2024) studies.	51.8	Geometric mean of NOAELs in Eco SSL	121	Growth endpoint (Dietz et al. 1992) as reported in EcoSSL
Beryllium	NA	No data available	--	No data available	0.532	Eco SSL NOAEL	0.63	Growth endpoint (Schroeder and Mitchener 1975) as reported in EcoSSL
Cadmium	1.47	Geometric mean of NOAELs in Eco SSL	2.40	Reproduction endpoint (Borkori et al. 1996) as reported in EcoSSL	0.770	Eco SSL NOAEL	7.70	Eco SSL Bounded LOAEL
Chromium	2.66	Geometric mean of NOAELs in Eco SSL	28.70	Growth endpoint (Nielsen et al. 1980) as reported in EcoSSL	2.40	Geometric mean of NOAELs in Eco SSL	36.20	Reproduction endpoint (Bataineh et al. 1997) as reported in EcoSSL
Hexavalent Chromium	4.48	Feeding Behavior endpoint (Asmatullah et al. 1999) as reported in EcoSSL document	8.97	Paired LOAEL from Asmatullah et al. 1999 as reported in EcoSSL document	9.240	Geometric mean of NOAELs in Eco SSL	13.14	Growth endpoint (Stephen et al 1976) as reported in Sample, 1996.
Cobalt	7.61	Geometric mean of NOAELs in Eco SSL	8.20	Growth endpoint (Ling et al. 1979) as reported in EcoSSL	7.330	Geometric mean of NOAELs in	20	Reproduction endpoint (Corrier et al. 1985) as reported in EcoSSL
Copper	4.05	Eco SSL NOAEL	12.10	Eco SSL Bounded LOAEL	5.60	Eco SSL NOAEL	9.34	Eco SSL Bounded LOAEL
Lead	1.63	Eco SSL NOAEL	3.26	Eco SSL Bounded LOAEL	4.70	Eco SSL NOAEL	8.9	Eco SSL Bounded LOAEL
Manganese	179	Geometric mean of NOAELs in Eco SSL	202	Reproduction endpoint (Sazzad et al. 1994) as reported in EcoSSL	51.50	Geometric mean of NOAELs in Eco SSL	71	Growth endpoint (Rehnberg et al 1980) as reported in EcoSSL
Mercury	0.450	Reproduction endpoint (Vos et al. 1971) as reported in Sample, 1996	0.90	Reproduction endpoint (Vos et al. 1971) as reported in Sample, 1996	1.41	Reproductive endpoint (Aulerich et al 1974) as reported in Sample 1996 and LANL 2024	14.1	Derived using factor of 10 applied to NOAEL. Value used in LANL (2024).
Nickel	6.71	Geometric mean of NOAELs in Eco SSL	20.80	Growth endpoint (Hill, 1979) as reported in the EcoSSL	1.70	Eco SSL NOAEL	3.4	Eco SSL Bounded LOAEL
Selenium	0.290	Eco SSL NOAEL	0.579	Eco SSL Bounded LOAEL	0.14	Eco SSL NOAEL	0.215	Eco SSL Bounded LOAEL

Table 6-4
Toxicity Reference Values for Wildlife

COPEC	Avian NOAELTRV (mg/kg-day)		Avian LOAELTRV (mg/kg-day)		Mammal NOAELTRV (mg/kg-day)		Mammal LOAEL TRV (mg/kg-day)	
Silver	2.02	The avian TRV for Silver is equal to the lowest LOAEL for growth divided by 10 and is equal to 2.02 mg/kg bw/day from Eco SSL	70.80	Growth endpoint (Peterson et al. 1973) as reported in EcoSS	6.02	The mammalian TRV for Silver is equal to the lowest LOAEL for reproduction or growth divided by 10 and is equal to 6.02 mg/kg bw/d from Eco SSL	126	Growth endpoint (Van Vleet et al. 1981) as reported in EcoSSL
Thallium	0.14	Survival endpoint, acute oral LD50, European Starlings (Schafer, 1972) as reported in TCEQ (2024). Adjusted using factor of 100.	1.40	Survival endpoint, acute oral LD50, European Starlings (Schafer, 1972) as reported in TCEQ (2024). Adjusted using factor of 10.	0.0071	Adjusted subchronic LOAEL, reproduction endpoint. (LANL, 2024)	0.074	Mortality endpoint (Formigli et al.1986) as reported in Sample, 1996.
Vanadium	0.344	Eco SSL NOAEL	0.688	Eco SSL Bounded LOAEL	4.16	Eco SSL NOAEL	8.31	Eco SSL Bounded LOAEL
Zinc	66.10	Geometric mean of NOAELs in Eco SSL	131	Reproduction endpoint (Stahl et al. 1990) as reported in Sample, 1996	74.50	Geometric mean of NOAELs in Eco SSL	320	Reproduction endpoint (Schlicker and Cox 1968) as reported in Sample 1996

Notes:
COPEC: Contaminants of potential ecological concern
Eco SSL: EPA's Ecological Soil Screening Levels
LD50: Lethal Dose to 50% of test population
LOAEL: Lowest observed adverse effect level
NOAEL: No observed adverse effect level
SSL: Soil screening level
TCEQ: Texas Comission on Environmental Quality
TRV: Toxicity reference value
LANL: Los Alamos national laboratoy

Figures

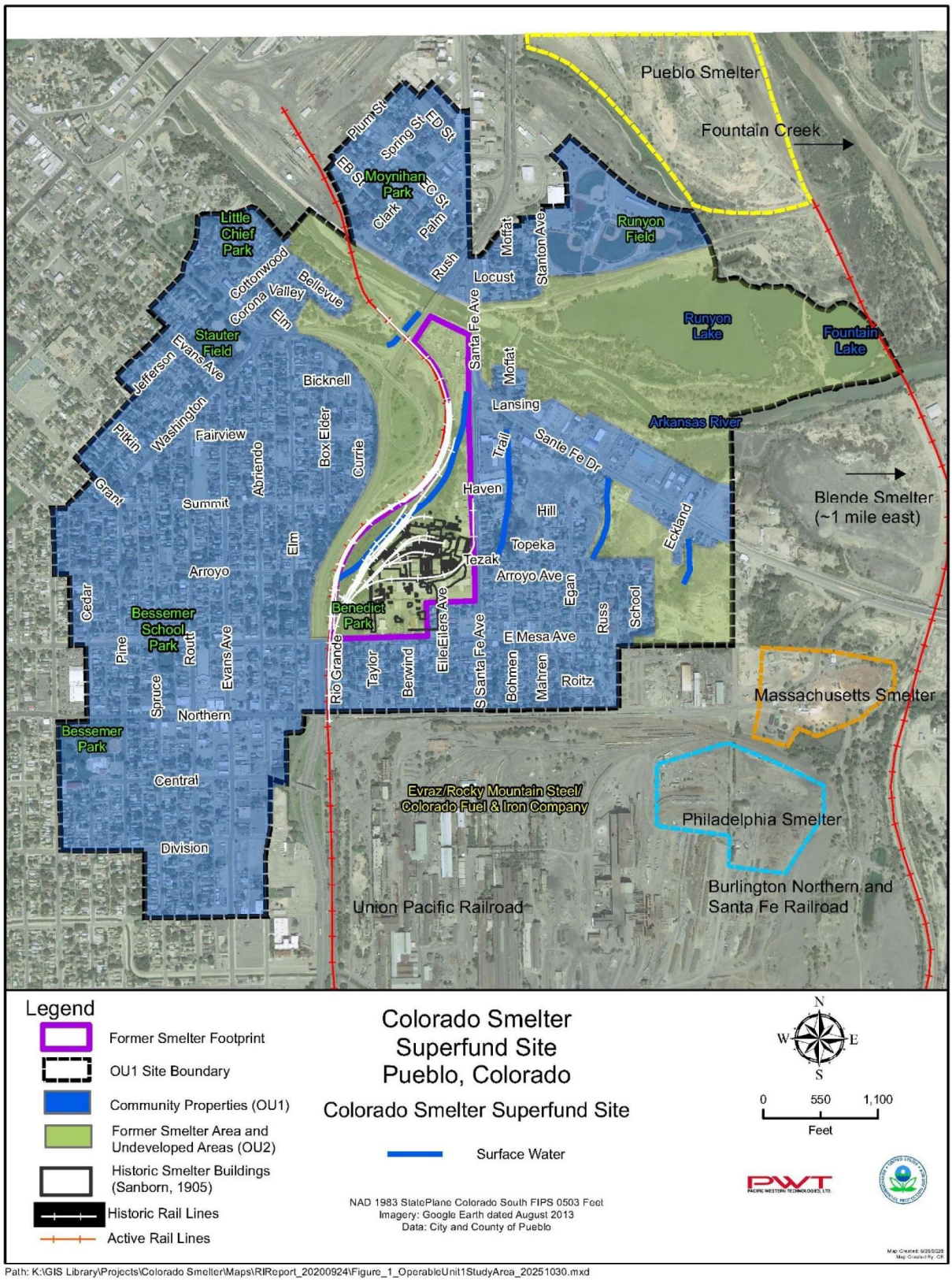
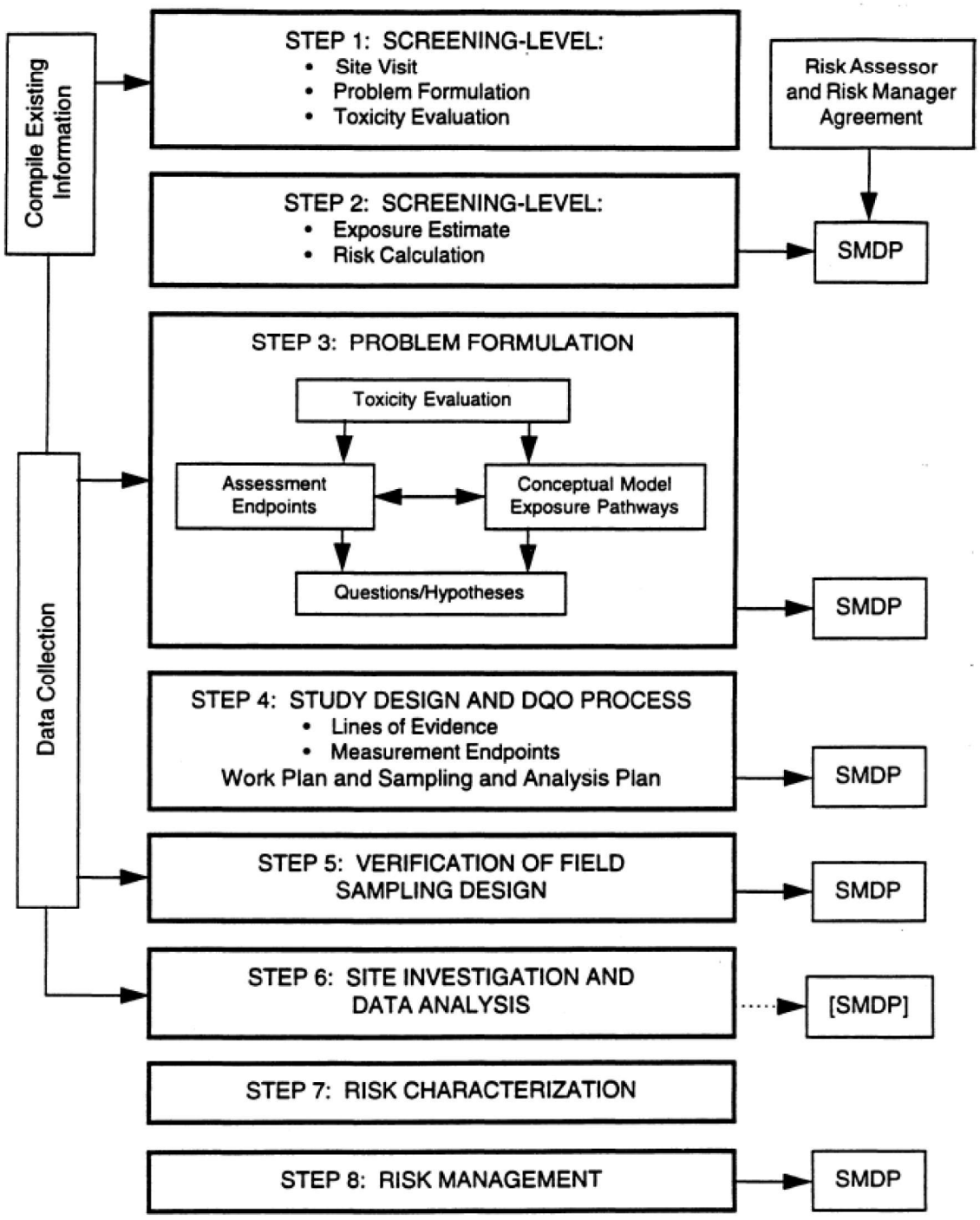


Figure 1 Colorado Smelter Site Superfund Site Location Map



Note: SMDP – Scientific Management Decision Point

Figure 2 Eight-step Ecological Risk Assessment for Superfund (USEPA, 1997)

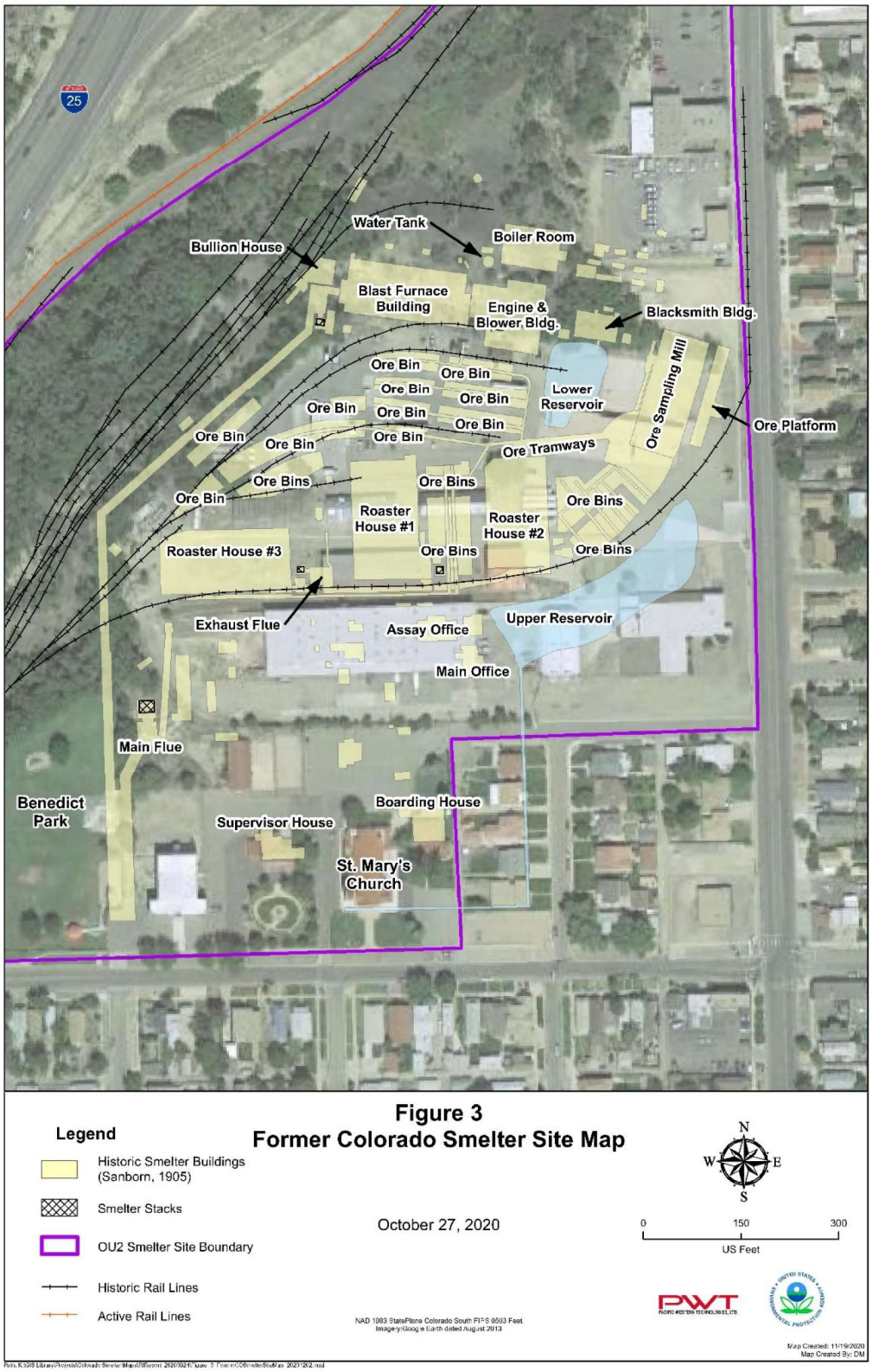


Figure 3 Historical Smelter Features

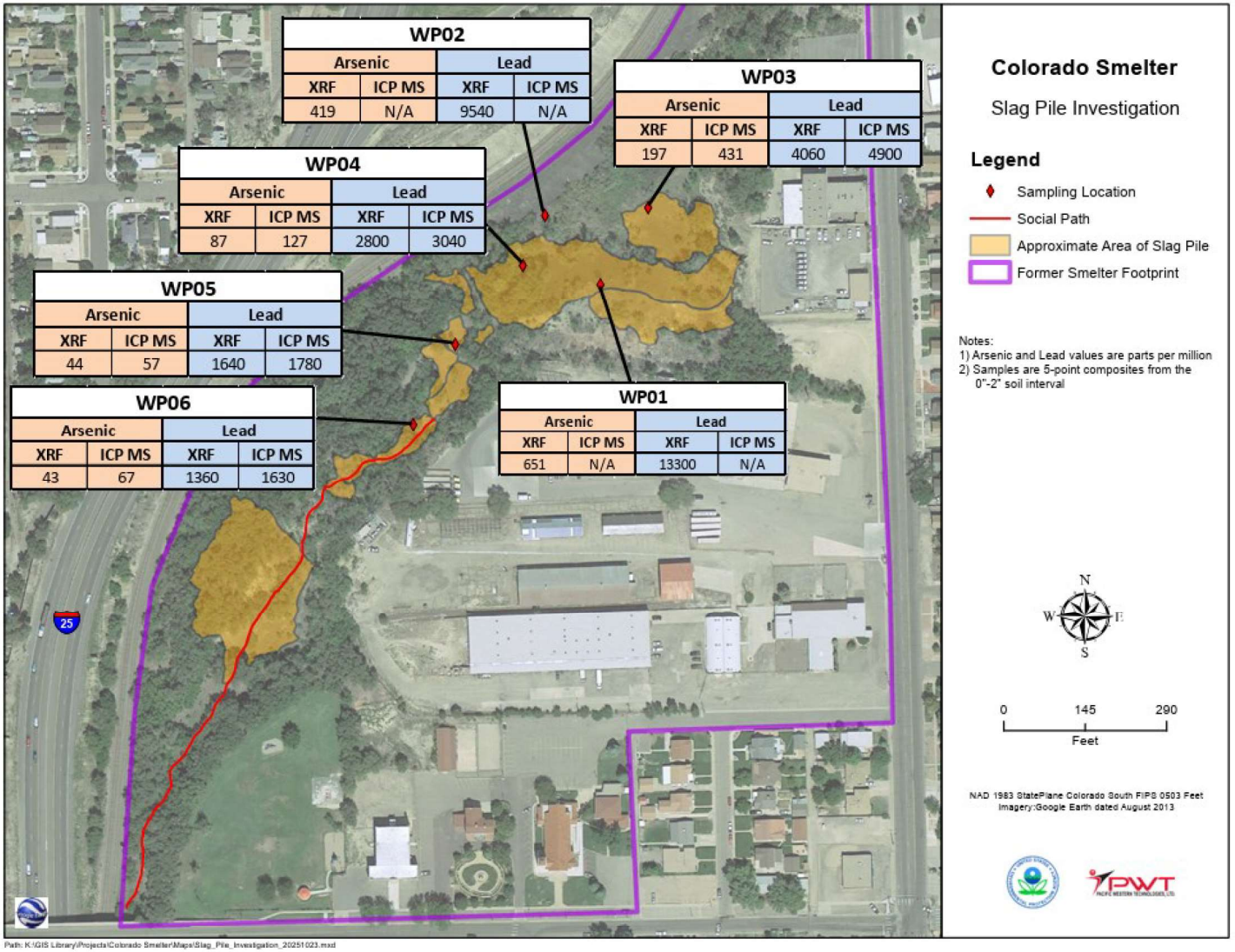


Figure 4 OU2 Slag Areas

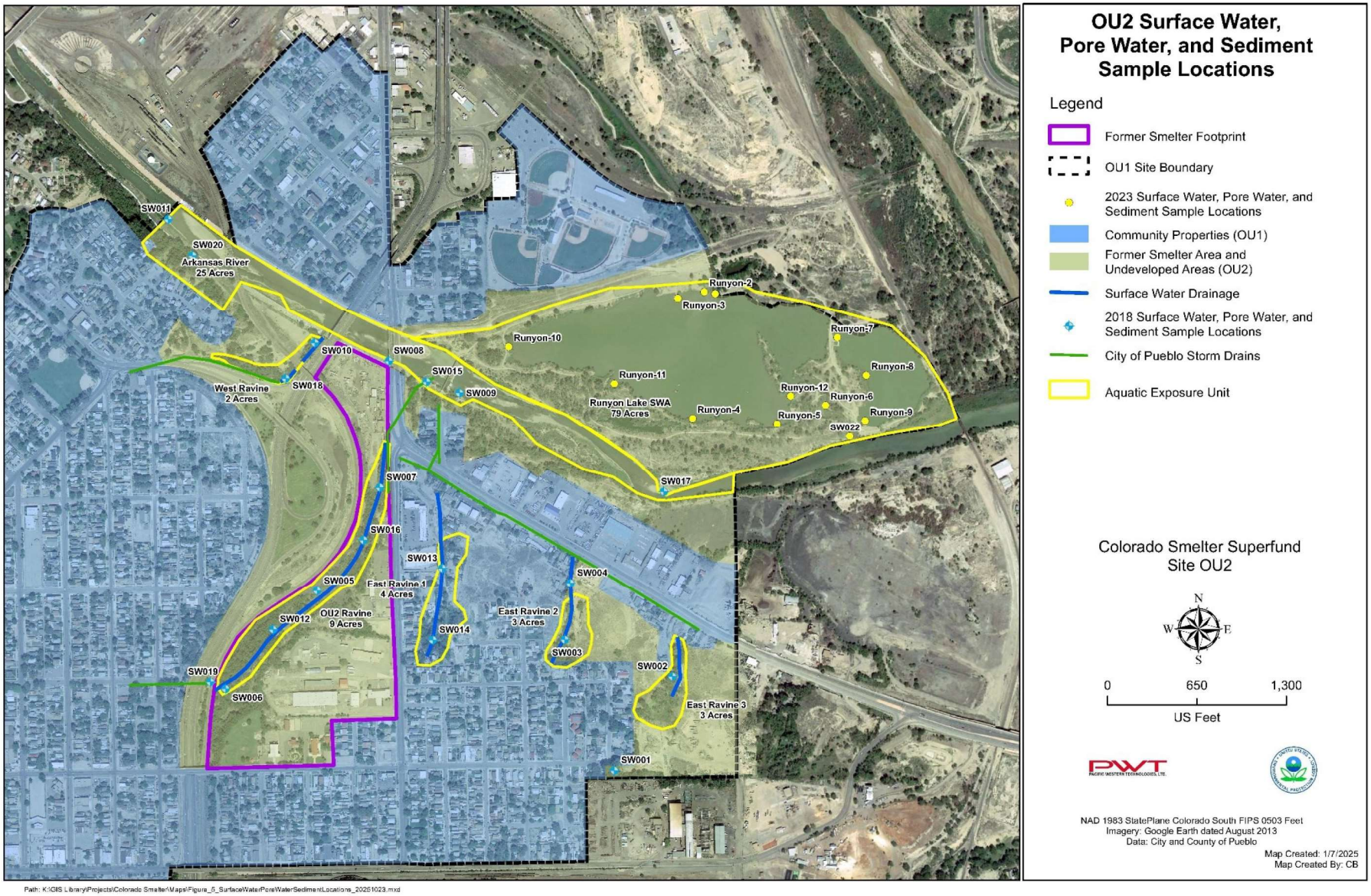


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Figure 5 OU2 Surface Water, Pore Water, and Sediment Sample Locations (2018 and 2023)

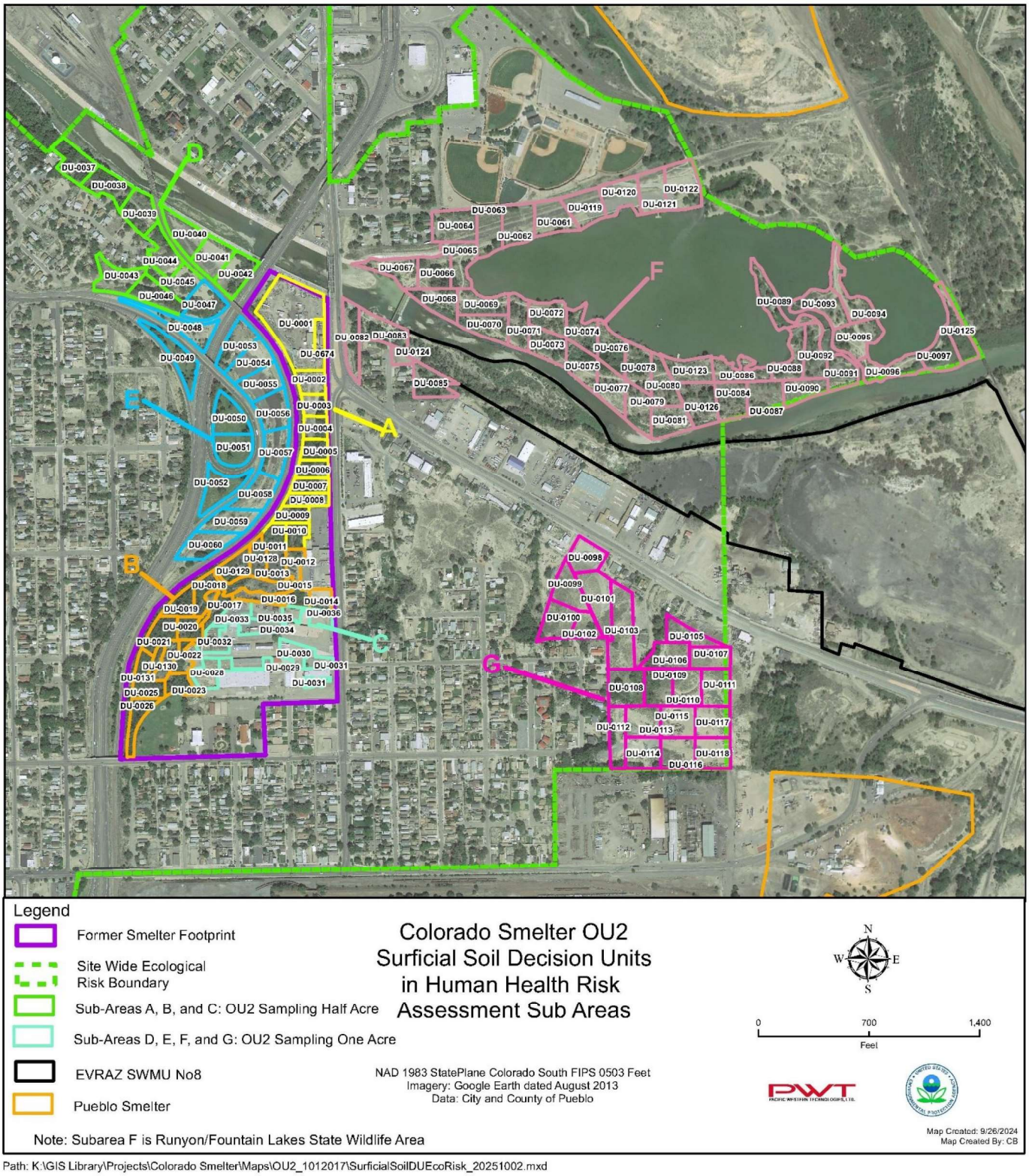

Figure 6 OU2 Surficial Soil Decision Units

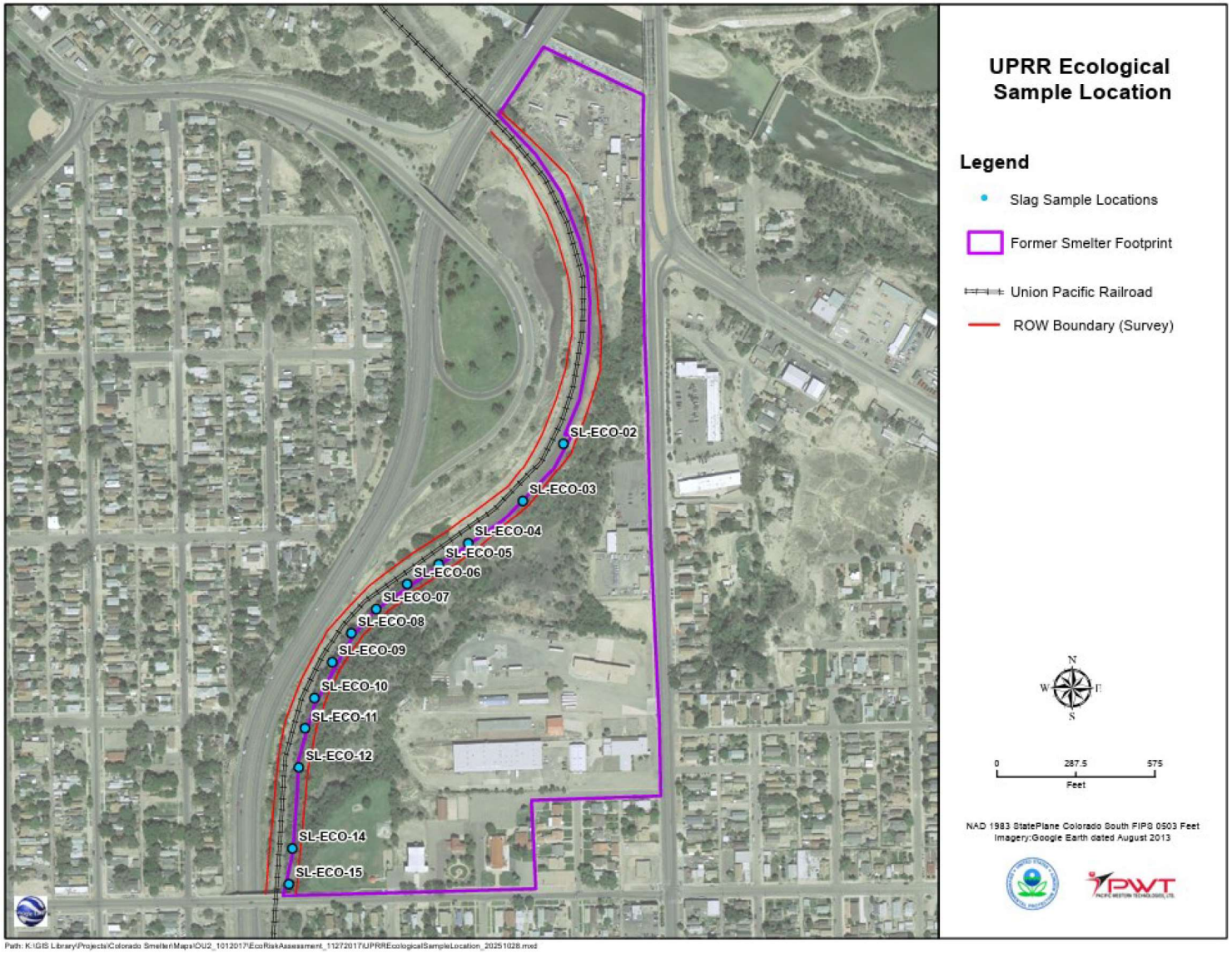

Figure 7 Union Pacific Railroad (UPRR) Ecological Sample Location

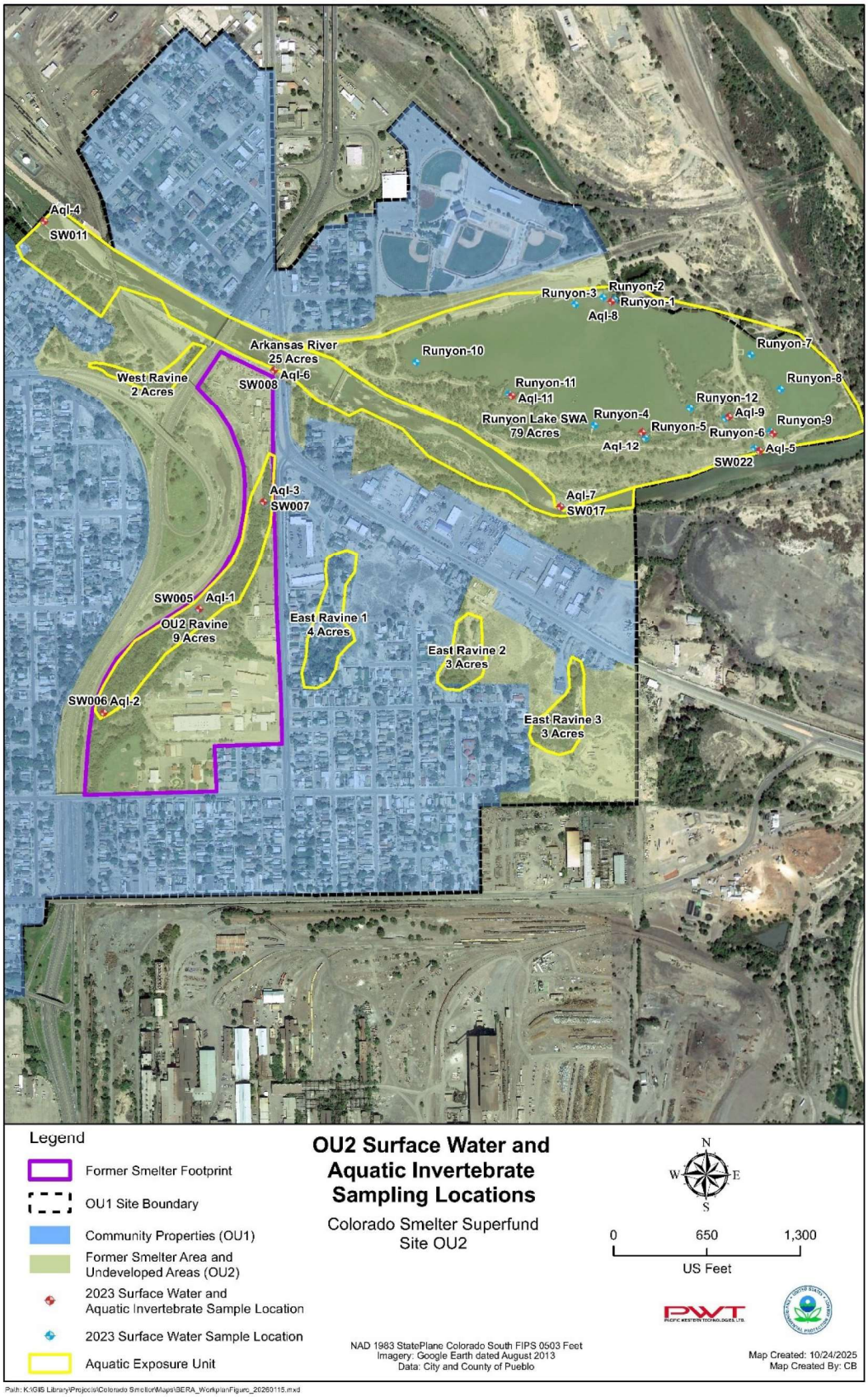

Figure 8 OU2 Surface Water and Aquatic Invertebrates Sampling Locations (2023)

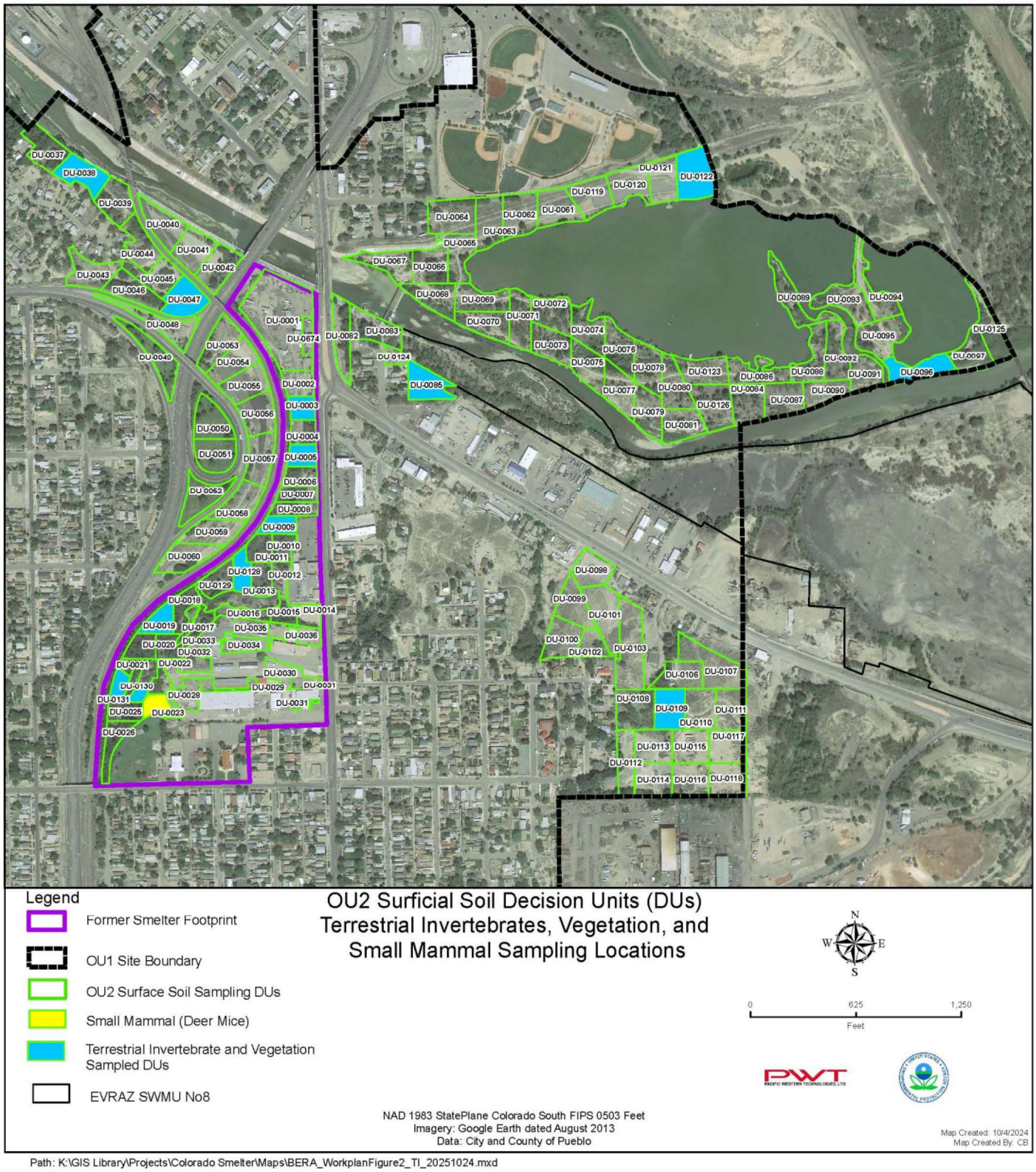

Figure 9 OU2 Surficial Soil Decision Units (DUs), Terrestrial Invertebrate, Vegetation, and Small Mammal Sampling Location

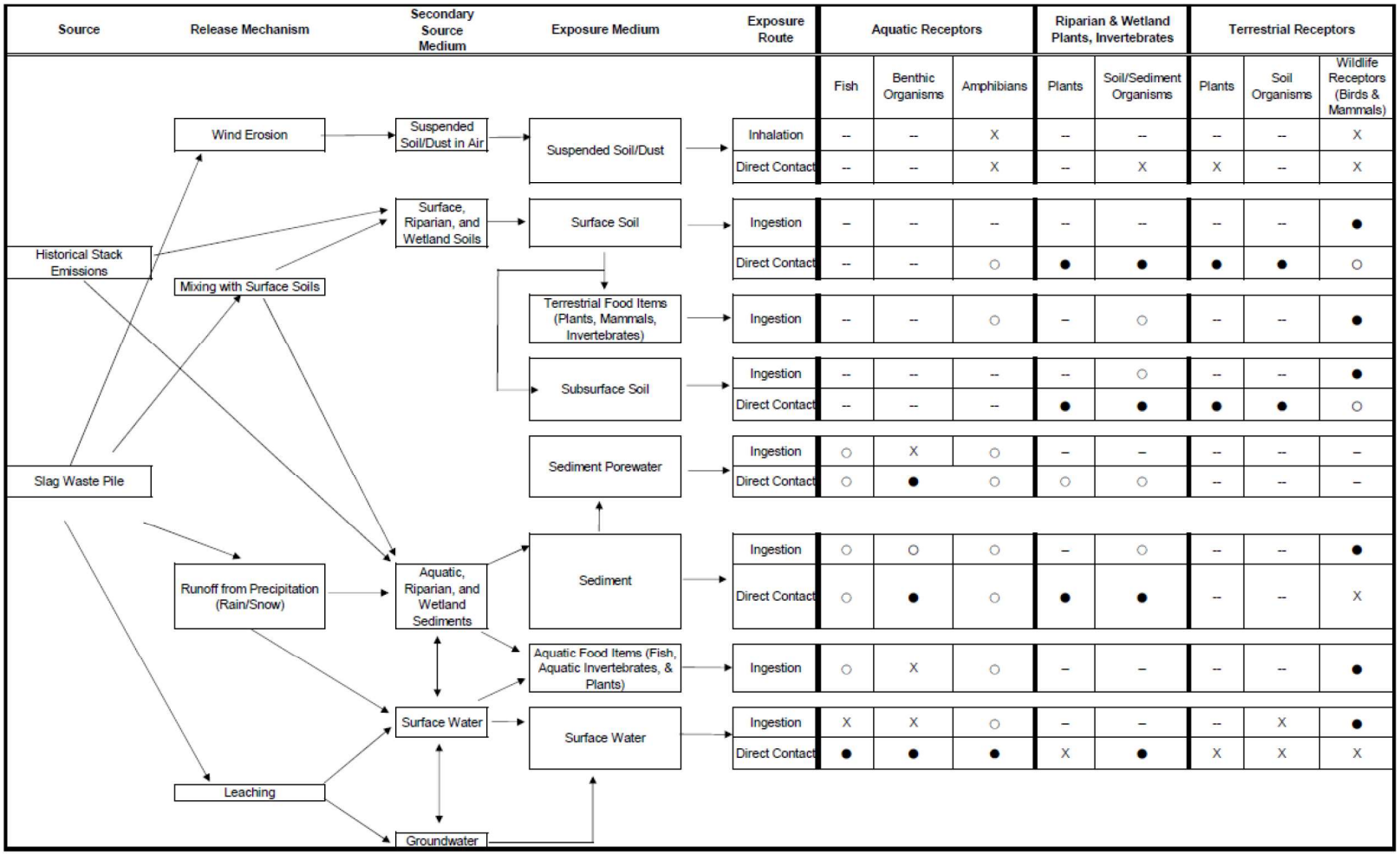

Figure 10 Conceptual Site Model

APPENDICES

Appendix A - Soil, Surface Water, Sediment and Pore Water Data Summary

Table A-1. Surface Water Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
Metals	Aluminum	7429-90-5	28	22	79%	251.284	169.722	SWRYN06-202305-01	714.500	47.075
Metals	Antimony	7440-36-0	28	4	14%	0.759	0.700	SW017-201912-01	0.165	1.105
Metals	Arsenic	7440-38-2	28	24	86%	1.168	0.259	SWRYN06-202305-01	1.440	0.774
Metals	Barium	7440-39-3	28	27	96%	58.356	5.534	SW009-201906-01	67.200	1.453
Metals	Beryllium	7440-41-7	28	0	0%	0.803	0.740	-	-	1.147
Metals	Cadmium	7440-43-9	28	0	0%	0.313	0.289	-	-	0.460
Metals	Chromium	7440-47-3	28	4	14%	1.882	0.649	SW009-202504-01	0.820	2.545
Metals	Cobalt	7440-48-4	28	4	14%	0.446	0.411	SW017-201909-01	0.170	0.646
Metals	Copper	7440-50-8	28	8	29%	1.872	1.612	SW009-201909-01	4.310	2.595
Metals	Iron	7439-89-6	28	24	86%	228.644	130.736	SWRYN06-202305-01	438.500	28.920
Metals	Lead	7439-92-1	28	19	68%	1.296	0.976	SW022-202305-01	3.340	0.332
Metals	Manganese	7439-96-5	28	27	96%	51.581	22.174	SW021-201909-01	110.000	1.336
Metals	Mercury	7439-97-6	28	24	86%	0.004	0.008	SWRYN08-202305-01	0.004	0.004
Metals	Nickel	7440-02-0	28	6	21%	2.139	1.965	SW009-202504-01; SW017-202504-01	2.700	3.033
Metals	Selenium	7782-49-2	28	27	96%	14.568	8.574	SW009-20190308-01	35.700	1.256
Metals	Silver	7440-22-4	28	0	0%	0.313	0.289	-	-	0.460
Metals	Thallium	7440-28-0	28	0	0%	0.581	0.536	-	-	0.834
Metals	Vanadium	7440-62-2	28	16	57%	2.186	0.943	SWRYN06-202305-01	3.900	1.724
Metals	Zinc	7440-66-6	28	6	21%	10.216	7.640	SWRYN06-202305-01	10.150	13.931
Metals, Diss	Aluminum	7429-90-5	28	6	21%	67.259	114.373	SWRYN01-202305-01	490.000	47.075
Metals, Diss	Antimony	7440-36-0	28	4	14%	0.759	0.700	SW017-201912-01	0.188	1.105
Metals, Diss	Arsenic	7440-38-2	28	24	86%	1.107	0.285	SWRYN04-202305-01	1.460	0.774
Metals, Diss	Barium	7440-39-3	28	27	96%	56.103	6.504	SW021-20190319-01	67.200	1.453
Metals, Diss	Beryllium	7440-41-7	27	0	0%	0.803	0.740	-	-	1.156
Metals, Diss	Cadmium	7440-43-9	28	0	0%	0.313	0.289	-	-	0.460
Metals, Diss	Chromium	7440-47-3	28	5	18%	1.882	0.649	SW009-201906-01	1.590	2.545
Metals, Diss	Cobalt	7440-48-4	28	5	18%	0.446	0.411	SW017-202504-01	0.940	0.646
Metals, Diss	Copper	7440-50-8	28	7	25%	1.912	1.618	SWRYN01-202305-01	2.450	2.595

Table A-1. Surface Water Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
Metals, Diss	Iron	7439-89-6	28	5	18%	74.838	133.290	SWRYN01-202305-01	384.000	28.920
Metals, Diss	Lead	7439-92-1	28	3	11%	0.424	0.770	SWRYN01-202305-01	3.210	0.332
Metals, Diss	Manganese	7439-96-5	28	27	96%	31.303	21.603	SWRYN01-202305-01	75.300	1.336
Metals, Diss	Mercury	7439-97-6	28	18	64%	0.003	0.008	SWRYN11-202305-01	0.001	0.004
Metals, Diss	Nickel	7440-02-0	28	7	25%	2.139	1.965	SW017-202504-01	3.000	3.033
Metals, Diss	Selenium	7782-49-2	28	27	96%	14.773	8.406	SW009-20190308-01; SW017-20190307-01	35.200	1.256
Metals, Diss	Silver	7440-22-4	28	0	0%	0.313	0.289	-	-	0.460
Metals, Diss	Thallium	7440-28-0	28	0	0%	0.581	0.536	-	-	0.834
Metals, Diss	Vanadium	7440-62-2	28	5	18%	1.311	1.022	SWRYN01-202305-01	2.920	1.724
Metals, Diss	Zinc	7440-66-6	28	4	14%	10.819	8.007	SWRYN01-202305-01	19.800	13.931
SVOCs	Acenaphthene	83-32-9	28	1	4%	0.026	0.065	SWRYN11-202305-01	0.270	0.020
SVOCs	Acenaphthylene	208-96-8	28	1	4%	0.029	0.064	SWRYN11-202305-01	0.270	0.024
SVOCs	Acetophenone	98-86-2	28	0	0%	0.806	0.187	-	-	1.326
SVOCs	Anthracene	120-12-7	28	1	4%	0.046	0.130	SWRYN11-202305-01	0.530	0.024
SVOCs	Atrazine	1912-24-9	28	0	0%	0.763	0.089	-	-	1.253
SVOCs	Benzaldehyde	100-52-7	28	0	0%	0.628	0.060	-	-	1.066
SVOCs	Benzo(a)anthracene	56-55-3	28	1	4%	0.028	0.078	SWRYN11-202305-01	0.320	0.018
SVOCs	Benzo(a)pyrene	50-32-8	28	1	4%	0.035	0.060	SWRYN11-202305-01	0.260	0.032
SVOCs	Benzo(b)fluoranthene	205-99-2	28	1	4%	0.027	0.065	SWRYN11-202305-01	0.270	0.018
SVOCs	Benzo(g,h,i)perylene	191-24-2	28	1	4%	0.025	0.044	SWRYN11-202305-01	0.190	0.024
SVOCs	Benzo(k)fluoranthene	207-08-9	28	1	4%	0.026	0.058	SWRYN11-202305-01	0.240	0.021
SVOCs	1,1'-Biphenyl	92-52-4	28	0	0%	0.585	0.466	-	-	1.036
SVOCs	4-Bromophenyl-phenylether	101-55-3	28	0	0%	0.563	0.439	-	-	1.012
SVOCs	Butylbenzylphthalate	85-68-7	28	0	0%	0.491	0.388	-	-	0.902
SVOCs	Caprolactam	105-60-2	28	0	0%	1.300	0.251	-	-	1.902
SVOCs	Carbazole	86-74-8	28	0	0%	0.688	0.249	-	-	1.148
SVOCs	4-Chloroaniline	106-47-8	28	0	0%	0.809	0.592	-	-	1.299
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	28	0	0%	0.495	0.164	-	-	0.924

Table A-1. Surface Water Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
SVOCs	Bis(2-Chloroethyl) ether	111-44-4	28	0	0%	0.647	0.119	-	-	1.125
SVOCs	4-Chloro-3-methylphenol	59-50-7	28	0	0%	0.638	0.249	-	-	1.094
SVOCs	2-Chloronaphthalene	91-58-7	28	0	0%	0.596	0.423	-	-	1.053
SVOCs	2-Chlorophenol	95-57-8	28	0	0%	0.566	0.281	-	-	1.006
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	28	0	0%	0.528	0.340	-	-	0.979
SVOCs	Chrysene	218-01-9	28	1	4%	0.028	0.067	SWRYN11-202305-01	0.280	0.020
SVOCs	Dibenzo(a,h)anthracene	53-70-3	28	1	4%	0.021	0.043	SWRYN11-202305-01	0.180	0.021
SVOCs	Dibenzofuran	132-64-9	28	0	0%	0.609	0.417	-	-	1.054
SVOCs	3,3'-Dichlorobenzidine	91-94-1	28	0	0%	0.847	0.783	-	-	1.360
SVOCs	2,4-Dichlorophenol	120-83-2	28	0	0%	0.529	0.210	-	-	0.985
SVOCs	Diethylphthalate	84-66-2	28	0	0%	0.423	0.439	-	-	0.834
SVOCs	2,4-Dimethylphenol	105-67-9	28	0	0%	0.690	0.068	-	-	1.114
SVOCs	Dimethylphthalate	131-11-3	28	6	21%	0.630	0.780	SW009-201909-01	2.600	0.923
SVOCs	Di-n-butylphthalate	84-74-2	28	0	0%	0.324	0.287	-	-	0.719
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	28	0	0%	1.059	0.144	-	-	1.619
SVOCs	2,4-Dinitrophenol	51-28-5	28	0	0%	1.216	0.686	-	-	1.776
SVOCs	2,4-Dinitrotoluene	121-14-2	28	0	0%	0.586	0.369	-	-	1.061
SVOCs	2,6-Dinitrotoluene	606-20-2	28	0	0%	0.575	0.587	-	-	1.006
SVOCs	Di-n-octylphthalate	117-84-0	28	0	0%	0.392	0.201	-	-	0.776
SVOCs	1,4-Dioxane	123-91-1	28	0	0%	0.383	0.083	-	-	0.649
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	28	0	0%	0.560	0.279	-	-	0.990
SVOCs	Fluoranthene	206-44-0	28	7	25%	0.054	0.120	SWRYN11-202305-01	0.500	0.023
SVOCs	Fluorene	86-73-7	28	1	4%	0.039	0.115	SWRYN11-202305-01	0.470	0.019
SVOCs	Hexachlorobenzene	118-74-1	28	0	0%	0.464	0.327	-	-	0.879
SVOCs	Hexachlorobutadiene	87-68-3	28	0	0%	0.558	0.173	-	-	0.982
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	28	0	0%	1.513	0.926	-	-	2.301
SVOCs	Hexachloroethane	67-72-1	28	0	0%	0.454	0.238	-	-	0.875
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	28	1	4%	0.024	0.044	SWRYN11-202305-01	0.190	0.024
SVOCs	Isophorone	78-59-1	28	0	0%	0.459	0.181	-	-	0.886

Table A-1. Surface Water Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
SVOCs	1-Methylnaphthalene	90-12-0	16	1	6%	0.026	0.065	SWRYN11-202305-01	0.260	0.018
SVOCs	2-Methylnaphthalene	91-57-6	28	3	11%	0.037	0.095	SWRYN11-202305-01	0.390	0.020
SVOCs	2-Methylphenol	95-48-7	28	0	0%	0.634	0.104	-	-	1.076
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	1	0	0%	0.300	-	-	-	0.600
SVOCs	4-Methylphenol	106-44-5	27	0	0%	0.575	0.205	-	-	1.021
SVOCs	Naphthalene	91-20-3	28	3	11%	0.047	0.087	SW017-202504-01	0.290	0.022
SVOCs	2-Nitroaniline	88-74-4	28	0	0%	0.850	0.441	-	-	1.361
SVOCs	3-Nitroaniline	99-09-2	28	0	0%	0.694	0.598	-	-	1.122
SVOCs	4-Nitroaniline	100-01-6	28	0	0%	0.863	0.454	-	-	1.346
SVOCs	Nitrobenzene	98-95-3	28	0	0%	0.703	0.022	-	-	1.190
SVOCs	2-Nitrophenol	88-75-5	28	0	0%	0.644	0.247	-	-	1.118
SVOCs	4-Nitrophenol	100-02-7	28	0	0%	0.791	0.248	-	-	1.339
SVOCs	N-Nitroso-di-n propylamine	621-64-7	28	0	0%	0.663	0.171	-	-	1.163
SVOCs	N-Nitrosodiphenylamine	86-30-6	28	0	0%	0.598	0.461	-	-	1.044
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	28	0	0%	0.966	0.104	-	-	1.507
SVOCs	Pentachlorophenol	87-86-5	28	1	4%	0.052	0.045	SWRYN11-202305-01	0.210	0.071
SVOCs	Phenanthrene	85-01-8	28	6	21%	0.048	0.113	SWRYN11-202305-01	0.470	0.023
SVOCs	Phenol	108-95-2	28	2	7%	0.788	0.188	SW021-201909-01	1.200	1.234
SVOCs	Pyrene	129-00-0	28	1	4%	0.049	0.139	SWRYN11-202305-01	0.570	0.025
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	28	1	4%	0.696	0.448	SWRYN11-202305-01	1.100	1.122
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	28	0	0%	0.513	0.439	-	-	0.966
SVOCs	2,4,5-Trichlorophenol	95-95-4	28	0	0%	0.599	0.441	-	-	1.049
SVOCs	2,4,6-Trichlorophenol	88-06-2	28	0	0%	0.675	0.451	-	-	1.128
VOCs	Acetone	67-64-1	28	2	7%	2.197	1.406	SWRYN08-202305-01	6.800	2.531
VOCs	Benzene	71-43-2	28	0	0%	0.259	0.073	-	-	0.332
VOCs	Bromochloromethane	74-97-5	28	0	0%	0.268	0.063	-	-	0.352
VOCs	Bromodichloromethane	75-27-4	28	0	0%	0.315	0.087	-	-	0.395
VOCs	Bromoform	75-25-2	28	0	0%	0.539	0.168	-	-	0.669
VOCs	Bromomethane	74-83-9	28	0	0%	0.537	0.172	-	-	0.678

Table A-1. Surface Water Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
VOCs	2-Butanone	78-93-3	28	0	0%	1.344	0.250	-	-	2.049
VOCs	Carbon disulfide	75-15-0	28	0	0%	0.393	0.128	-	-	0.483
VOCs	Carbon tetrachloride	56-23-5	28	0	0%	0.299	0.075	-	-	0.385
VOCs	Chlorobenzene	108-90-7	28	0	0%	0.223	0.063	-	-	0.286
VOCs	Chloroethane	75-00-3	28	0	0%	0.305	0.084	-	-	0.402
VOCs	Chloroform	67-66-3	28	3	11%	0.874	0.233	SW021-201912-01	1.300	0.953
VOCs	Chloromethane	74-87-3	28	0	0%	0.582	0.187	-	-	0.711
VOCs	Cyclohexane	110-82-7	28	0	0%	0.272	0.066	-	-	0.356
VOCs	Dibromochloromethane	124-48-1	28	0	0%	0.330	0.087	-	-	0.417
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	28	0	0%	0.591	0.163	-	-	0.769
VOCs	1,2-Dibromoethane	106-93-4	28	0	0%	0.383	0.116	-	-	0.479
VOCs	1,2-Dichlorobenzene	95-50-1	28	0	0%	0.378	0.117	-	-	0.470
VOCs	1,3-Dichlorobenzene	541-73-1	28	0	0%	0.281	0.080	-	-	0.358
VOCs	1,4-Dichlorobenzene	106-46-7	28	0	0%	0.260	0.071	-	-	0.336
VOCs	Dichlorodifluoromethane	75-71-8	28	0	0%	0.263	0.065	-	-	0.345
VOCs	1,1-Dichloroethane	75-34-3	28	0	0%	0.282	0.090	-	-	0.356
VOCs	1,2-Dichloroethane	107-06-2	28	0	0%	0.361	0.119	-	-	0.447
VOCs	1,1-Dichloroethene	75-35-4	28	0	0%	0.402	0.118	-	-	0.500
VOCs	cis-1,2-Dichloroethene	156-59-2	28	0	0%	0.314	0.088	-	-	0.398
VOCs	trans-1,2-Dichloroethene	156-60-5	28	0	0%	0.253	0.061	-	-	0.327
VOCs	1,2-Dichloropropane	78-87-5	28	0	0%	0.255	0.069	-	-	0.337
VOCs	cis-1,3-Dichloropropene	10061-01-5	28	0	0%	0.278	0.065	-	-	0.361
VOCs	trans-1,3-Dichloropropene	10061-02-6	28	0	0%	0.330	0.099	-	-	0.412
VOCs	Ethylbenzene	100-41-4	28	0	0%	0.240	0.070	-	-	0.306
VOCs	2-Hexanone	591-78-6	28	0	0%	2.623	0.690	-	-	3.393
VOCs	Isopropylbenzene	98-82-8	28	0	0%	0.265	0.082	-	-	0.333
VOCs	Methyl acetate	79-20-9	28	0	0%	0.499	0.139	-	-	0.651
VOCs	Methyl tert-butyl ether	1634-04-4	28	0	0%	0.229	0.060	-	-	0.299
VOCs	Methylene chloride	75-09-2	28	0	0%	0.805	0.262	-	-	0.968

Table A-1. Surface Water Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
VOCs	Methylcyclohexane	108-87-2	28	0	0%	0.331	0.087	-	-	0.421
VOCs	4-Methyl-2-pentanone	108-10-1	28	0	0%	0.819	0.390	-	-	1.249
VOCs	Styrene	100-42-5	28	0	0%	0.279	0.085	-	-	0.348
VOCs	Tetrachloroethene	127-18-4	28	0	0%	0.248	0.063	-	-	0.317
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	28	0	0%	0.443	0.128	-	-	0.559
VOCs	Toluene	108-88-3	28	0	0%	0.579	0.195	-	-	0.695
VOCs	1,1,1-Trichloroethane	71-55-6	28	0	0%	0.271	0.071	-	-	0.350
VOCs	1,1,2-Trichloroethane	79-00-5	28	0	0%	0.354	0.091	-	-	0.455
VOCs	1,2,3-Trichlorobenzene	87-61-6	28	0	0%	0.388	0.116	-	-	0.487
VOCs	1,2,4-Trichlorobenzene	120-82-1	28	0	0%	0.537	0.174	-	-	0.653
VOCs	Trichloroethene	79-01-6	28	0	0%	0.361	0.108	-	-	0.451
VOCs	Trichlorofluoromethane	75-69-4	28	0	0%	0.294	0.087	-	-	0.373
VOCs	1,2,3-Trichloropropane	96-18-4	16	0	0%	0.574	0.102	-	-	1.101
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	28	0	0%	0.445	0.139	-	-	0.554
VOCs	1,2,4-Trimethylbenzene	95-63-6	16	0	0%	0.312	0.050	-	-	0.601
VOCs	1,3,5-Trimethylbenzene	108-67-8	16	0	0%	0.262	0.050	-	-	0.501
VOCs	Vinyl chloride	75-01-4	28	0	0%	0.369	0.113	-	-	0.460
VOCs	m, p-Xylene	179601-23-1	28	0	0%	0.248	0.074	-	-	0.315
VOCs	o-Xylene	95-47-6	28	0	0%	0.279	0.086	-	-	0.351

Notes:

SVOCs: Semi volatile organic compounds

VOCs: Volatile organic compounds

MDL: Method detection limit

µg/L: Microgram per liter

Table A-2. Surface Water Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
Metals	Aluminum	7429-90-5	85	39	46%	241.458	363.224	SW012-20190315-01	1,580.000	46.161
Metals	Antimony	7440-36-0	85	20	24%	2.471	0.676	SW005-201909-01	4.740	1.545
Metals	Arsenic	7440-38-2	85	54	64%	3.576	3.325	SW005-201909-01	10.900	1.083
Metals	Barium	7440-39-3	85	85	100%	41.994	16.306	SW011-201906-01	78.900	2.019
Metals	Beryllium	7440-41-7	85	1	1%	2.257	0.118	SW011-201912-01	0.254	1.589
Metals	Cadmium	7440-43-9	85	24	28%	0.973	0.192	SW005-201909-01	1.570	0.643
Metals	Chromium	7440-47-3	85	17	20%	3.649	1.516	SW012-20190315-01	9.410	2.347
Metals	Cobalt	7440-48-4	85	32	38%	1.261	0.060	SW010-201912-01	0.953	0.897
Metals	Copper	7440-50-8	85	38	45%	12.642	21.125	SW005-201909-01	94.500	3.544
Metals	Iron	7439-89-6	85	52	61%	2,083.594	3,988.625	SW008-201906-01	17,600.000	39.954
Metals	Lead	7439-92-1	85	52	61%	12.027	28.135	SW005-201909-01	95.800	0.464
Metals	Manganese	7439-96-5	85	77	91%	103.022	148.931	SW002-201909-01	511.000	1.870
Metals	Mercury	7439-97-6	85	74	87%	0.013	0.011	SW012-20190315-01	0.027	0.005
Metals	Nickel	7440-02-0	85	45	53%	7.833	5.970	SW007-201906-01	31.610	4.229
Metals	Selenium	7782-49-2	85	83	98%	55.719	37.244	SW019-201906-01	118.000	1.749
Metals	Silver	7440-22-4	85	0	0%	0.895	0.000	-	-	0.643
Metals	Thallium	7440-28-0	85	0	0%	1.651	0.039	-	-	1.164
Metals	Vanadium	7440-62-2	85	38	45%	5.863	9.899	SW001-201909-01	45.300	2.235
Metals	Zinc	7440-66-6	85	44	52%	203.369	300.407	SW005-201909-01	950.000	17.841
Metals, Diss	Aluminum	7429-90-5	85	12	14%	72.983	29.905	SW006-202308-01	190.000	46.314
Metals, Diss	Antimony	7440-36-0	85	20	24%	2.479	0.702	SW005-201909-01	4.870	1.545
Metals, Diss	Arsenic	7440-38-2	85	50	59%	3.472	3.363	SW005-201909-01	11.100	1.083
Metals, Diss	Barium	7440-39-3	85	85	100%	37.250	13.407	SW011-20190312-01	66.300	2.019
Metals, Diss	Beryllium	7440-41-7	85	2	2%	2.426	0.555	SW011-20190312-01	4.650	1.605
Metals, Diss	Cadmium	7440-43-9	85	23	27%	0.966	0.168	SW016-201906-01	1.420	0.643
Metals, Diss	Chromium	7440-47-3	85	14	16%	3.190	0.000	SW001-201909-01	2.180	2.355
Metals, Diss	Cobalt	7440-48-4	85	34	40%	1.275	0.000	SW006-202504-01	1.100	0.903
Metals, Diss	Copper	7440-50-8	85	32	38%	11.261	20.142	SW005-201909-01	90.600	3.556
Metals, Diss	Iron	7439-89-6	85	21	25%	1,779.244	3,435.492	SW008-20190308-01	14,800.000	40.194

Table A-2. Surface Water Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
Metals, Diss	Lead	7439-92-1	85	25	29%	6.101	21.271	SW005-201909-01	91.100	0.464
Metals, Diss	Manganese	7439-96-5	85	72	85%	84.097	138.719	SW008-201912-01	472.000	1.870
Metals, Diss	Mercury	7439-97-6	85	70	82%	0.011	0.012	SW007-202308-01	0.005	0.005
Metals, Diss	Nickel	7440-02-0	85	47	55%	6.640	0.717	SW015-202504-01	8.000	4.243
Metals, Diss	Selenium	7782-49-2	85	83	98%	55.313	36.611	SW012-201906-01	107.000	1.749
Metals, Diss	Silver	7440-22-4	85	0	0%	0.895	0.000	-	-	0.643
Metals, Diss	Thallium	7440-28-0	85	0	0%	1.660	0.000	-	-	1.168
Metals, Diss	Vanadium	7440-62-2	85	29	34%	5.334	9.650	SW001-201909-01	44.000	2.242
Metals, Diss	Zinc	7440-66-6	85	37	44%	183.178	302.688	SW005-201909-01	929.000	17.841
SVOCs	Acenaphthene	83-32-9	85	4	5%	0.023	0.003	SW010-20190325-01-SV	0.031	0.023
SVOCs	Acenaphthylene	208-96-8	85	1	1%	0.021	0.002	SW008-20190322-01-SV	0.015	0.024
SVOCs	Acetophenone	98-86-2	85	0	0%	0.918	0.328	-	-	1.115
SVOCs	Anthracene	120-12-7	85	1	1%	0.029	0.013	SW006-201912-01	0.020	0.026
SVOCs	Atrazine	1912-24-9	85	0	0%	0.742	0.181	-	-	0.997
SVOCs	Benzaldehyde	100-52-7	85	0	0%	0.764	0.023	-	-	0.933
SVOCs	Benzo(a)anthracene	56-55-3	85	6	7%	0.028	0.026	SW005-201909-01	0.130	0.023
SVOCs	Benzo(a)pyrene	50-32-8	85	4	5%	0.031	0.033	SW005-201909-01	0.160	0.025
SVOCs	Benzo(b)fluoranthene	205-99-2	85	10	12%	0.045	0.056	SW005-201909-01	0.250	0.019
SVOCs	Benzo(g,h,i)perylene	191-24-2	85	3	4%	0.026	0.022	SW005-201909-01	0.110	0.023
SVOCs	Benzo(k)fluoranthene	207-08-9	85	2	2%	0.033	0.012	SW005-201909-01	0.080	0.027
SVOCs	1,1'-Biphenyl	92-52-4	85	0	0%	1.104	0.615	-	-	1.133
SVOCs	4-Bromophenyl-phenylether	101-55-3	85	0	0%	1.106	0.521	-	-	1.126
SVOCs	Butylbenzylphthalate	85-68-7	85	0	0%	0.964	0.468	-	-	1.015
SVOCs	Caprolactam	105-60-2	85	0	0%	1.285	0.552	-	-	1.276
SVOCs	Carbazole	86-74-8	85	0	0%	0.907	0.383	-	-	1.039
SVOCs	4-Chloroaniline	106-47-8	85	0	0%	1.335	0.909	-	-	1.248
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	85	0	0%	0.736	0.136	-	-	0.958
SVOCs	Bis(2-Chloroethyl) ether	111-44-4	85	0	0%	0.786	0.136	-	-	1.024

Table A-2. Surface Water Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
SVOCs	4-Chloro-3-methylphenol	59-50-7	85	0	0%	0.860	0.380	-	-	1.015
SVOCs	2-Chloronaphthalene	91-58-7	85	0	0%	1.076	0.548	-	-	1.125
SVOCs	2-Chlorophenol	95-57-8	85	0	0%	0.926	0.318	-	-	1.039
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	85	0	0%	1.003	0.340	-	-	1.104
SVOCs	Chrysene	218-01-9	85	4	5%	0.030	0.039	SW005-201909-01	0.180	0.020
SVOCs	Dibenzo(a,h)anthracene	53-70-3	85	1	1%	0.020	0.001	SW006-201912-01	0.020	0.026
SVOCs	Dibenzofuran	132-64-9	85	0	0%	1.060	0.564	-	-	1.100
SVOCs	3,3'-Dichlorobenzidine	91-94-1	85	0	0%	1.663	1.085	-	-	1.394
SVOCs	2,4-Dichlorophenol	120-83-2	85	0	0%	0.831	0.186	-	-	1.033
SVOCs	Diethylphthalate	84-66-2	85	0	0%	1.021	0.462	-	-	1.072
SVOCs	2,4-Dimethylphenol	105-67-9	85	0	0%	0.599	0.150	-	-	0.835
SVOCs	Dimethylphthalate	131-11-3	85	28	33%	2.781	1.351	SW020-201909-01	5.500	1.152
SVOCs	Di-n-butylphthalate	84-74-2	85	0	0%	0.811	0.159	-	-	0.968
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	85	0	0%	0.982	0.326	-	-	1.132
SVOCs	2,4-Dinitrophenol	51-28-5	85	0	0%	1.638	1.204	-	-	1.365
SVOCs	2,4-Dinitrotoluene	121-14-2	85	0	0%	1.021	0.462	-	-	1.138
SVOCs	2,6-Dinitrotoluene	606-20-2	85	0	0%	1.210	0.794	-	-	1.147
SVOCs	Di-n-octylphthalate	117-84-0	85	0	0%	0.630	0.232	-	-	0.873
SVOCs	1,4-Dioxane	123-91-1	85	0	0%	0.561	0.021	-	-	0.613
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	85	0	0%	0.854	0.385	-	-	0.994
SVOCs	Fluoranthene	206-44-0	85	6	7%	0.037	0.049	SW005-201909-01	0.220	0.022
SVOCs	Fluorene	86-73-7	85	0	0%	0.018	0.003	-	-	0.021
SVOCs	Hexachlorobenzene	118-74-1	85	0	0%	0.938	0.309	-	-	1.019
SVOCs	Hexachlorobutadiene	87-68-3	85	0	0%	0.743	0.220	-	-	0.937
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	85	0	0%	2.542	1.233	-	-	2.056
SVOCs	Hexachloroethane	67-72-1	85	0	0%	0.768	0.243	-	-	0.970
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	85	2	2%	0.023	0.017	SW005-201909-01	0.090	0.025
SVOCs	Isophorone	78-59-1	85	0	0%	0.729	0.141	-	-	0.964
SVOCs	1-Methylnaphthalene	90-12-0	13	0	0%	0.022	0.006	-	-	0.036

Table A-2. Surface Water Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
SVOCs	2-Methylnaphthalene	91-57-6	85	4	5%	0.024	0.008	SW007-202504-01	0.043	0.024
SVOCs	2-Methylphenol	95-48-7	85	0	0%	0.700	0.168	-	-	0.932
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	10	0	0%	0.308	0.008	-	-	0.615
SVOCs	4-Methylphenol	106-44-5	75	1	1%	1.094	1.437	SW007-201906-01	6.750	1.023
SVOCs	Naphthalene	91-20-3	85	12	14%	0.092	0.075	SW007-202504-01	0.230	0.026
SVOCs	2-Nitroaniline	88-74-4	85	0	0%	1.201	0.710	-	-	1.207
SVOCs	3-Nitroaniline	99-09-2	85	0	0%	1.229	0.914	-	-	1.117
SVOCs	4-Nitroaniline	100-01-6	85	0	0%	1.276	0.687	-	-	1.178
SVOCs	Nitrobenzene	98-95-3	85	0	0%	0.701	0.047	-	-	0.986
SVOCs	2-Nitrophenol	88-75-5	85	0	0%	0.910	0.334	-	-	1.071
SVOCs	4-Nitrophenol	100-02-7	85	0	0%	1.032	0.360	-	-	1.219
SVOCs	N-Nitroso-di-n propylamine	621-64-7	85	0	0%	0.825	0.237	-	-	1.081
SVOCs	N-Nitrosodiphenylamine	86-30-6	85	0	0%	1.107	0.612	-	-	1.126
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	85	0	0%	0.778	0.170	-	-	1.050
SVOCs	Pentachlorophenol	87-86-5	85	2	2%	0.067	0.003	SW016-201909-01	0.060	0.067
SVOCs	Phenanthrene	85-01-8	85	2	2%	0.024	0.019	SW005-201909-01	0.100	0.023
SVOCs	Phenol	108-95-2	85	6	7%	1.083	0.336	SW001-201909-01	1.800	1.038
SVOCs	Pyrene	129-00-0	85	6	7%	0.037	0.042	SW005-201909-01	0.200	0.025
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	85	0	0%	1.121	0.599	-	-	1.139
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	85	0	0%	1.068	0.510	-	-	1.138
SVOCs	2,4,5-Trichlorophenol	95-95-4	85	0	0%	1.085	0.587	-	-	1.111
SVOCs	2,4,6-Trichlorophenol	88-06-2	85	0	0%	1.171	0.599	-	-	1.130
VOCs	Acetone	67-64-1	85	4	5%	1.750	1.206	SW001-201906-01	5.600	1.617
VOCs	Benzene	71-43-2	85	0	0%	0.097	0.079	-	-	0.093
VOCs	Bromochloromethane	74-97-5	85	0	0%	0.130	0.081	-	-	0.134
VOCs	Bromodichloromethane	75-27-4	85	0	0%	0.121	0.104	-	-	0.096
VOCs	Bromoform	75-25-2	85	0	0%	0.165	0.171	-	-	0.138
VOCs	Bromomethane	74-83-9	85	0	0%	0.165	0.163	-	-	0.151
VOCs	2-Butanone	78-93-3	85	0	0%	1.317	0.549	-	-	1.375

Table A-2. Surface Water Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
VOCs	Carbon disulfide	75-15-0	85	4	5%	0.228	0.532	SW001-201906-01	2.300	0.093
VOCs	Carbon tetrachloride	56-23-5	85	0	0%	0.135	0.097	-	-	0.119
VOCs	Chlorobenzene	108-90-7	85	0	0%	0.086	0.069	-	-	0.077
VOCs	Chloroethane	75-00-3	85	0	0%	0.131	0.083	-	-	0.129
VOCs	Chloroform	67-66-3	85	11	13%	0.434	0.528	SW001-201906-01	2.100	0.147
VOCs	Chloromethane	74-87-3	85	0	0%	0.162	0.186	-	-	0.130
VOCs	Cyclohexane	110-82-7	85	0	0%	0.126	0.086	-	-	0.124
VOCs	Dibromochloromethane	124-48-1	85	0	0%	0.137	0.107	-	-	0.117
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	85	0	0%	0.225	0.156	-	-	0.286
VOCs	1,2-Dibromoethane	106-93-4	85	0	0%	0.126	0.118	-	-	0.110
VOCs	1,2-Dichlorobenzene	95-50-1	85	0	0%	0.116	0.116	-	-	0.109
VOCs	1,3-Dichlorobenzene	541-73-1	85	1	1%	0.119	0.111	SW015-20190327-01	0.410	0.098
VOCs	1,4-Dichlorobenzene	106-46-7	85	0	0%	0.107	0.083	-	-	0.094
VOCs	Dichlorodifluoromethane	75-71-8	85	0	0%	0.120	0.085	-	-	0.113
VOCs	1,1-Dichloroethane	75-34-3	85	0	0%	0.081	0.086	-	-	0.083
VOCs	1,2-Dichloroethane	107-06-2	85	4	5%	0.092	0.114	SW008-201912-01	0.320	0.087
VOCs	1,1-Dichloroethene	75-35-4	85	0	0%	0.127	0.122	-	-	0.122
VOCs	cis-1,2-Dichloroethene	156-59-2	85	0	0%	0.119	0.099	-	-	0.104
VOCs	trans-1,2-Dichloroethene	156-60-5	85	0	0%	0.116	0.074	-	-	0.115
VOCs	1,2-Dichloropropane	78-87-5	85	0	0%	0.105	0.072	-	-	0.103
VOCs	cis-1,3-Dichloropropene	10061-01-5	85	0	0%	0.131	0.086	-	-	0.124
VOCs	trans-1,3-Dichloropropene	10061-02-6	85	0	0%	0.111	0.106	-	-	0.091
VOCs	Ethylbenzene	100-41-4	85	0	0%	0.084	0.072	-	-	0.081
VOCs	2-Hexanone	591-78-6	85	0	0%	1.213	0.938	-	-	0.912
VOCs	Isopropylbenzene	98-82-8	85	0	0%	0.081	0.081	-	-	0.080
VOCs	Methyl acetate	79-20-9	85	0	0%	0.185	0.134	-	-	0.229
VOCs	Methyl tert-butyl ether	1634-04-4	85	4	5%	0.182	0.384	SW008-20190308-01	1.700	0.090
VOCs	Methylene chloride	75-09-2	85	2	2%	0.232	0.271	SW015-202504-01	0.450	0.170
VOCs	Methylcyclohexane	108-87-2	85	0	0%	0.145	0.114	-	-	0.120

Table A-2. Surface Water Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
VOCs	4-Methyl-2-pentanone	108-10-1	85	0	0%	1.051	0.693	-	-	0.974
VOCs	Styrene	100-42-5	85	0	0%	0.089	0.087	-	-	0.081
VOCs	Tetrachloroethene	127-18-4	85	1	1%	0.108	0.074	SW019-20190318-01	0.046	0.097
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	85	0	0%	0.155	0.126	-	-	0.147
VOCs	Toluene	108-88-3	85	3	4%	0.151	0.190	SW001-201909-01	0.220	0.106
VOCs	1,1,1-Trichloroethane	71-55-6	85	0	0%	0.117	0.088	-	-	0.105
VOCs	1,1,2-Trichloroethane	79-00-5	85	0	0%	0.157	0.120	-	-	0.134
VOCs	1,2,3-Trichlorobenzene	87-61-6	85	0	0%	0.135	0.120	-	-	0.126
VOCs	1,2,4-Trichlorobenzene	120-82-1	85	0	0%	0.147	0.174	-	-	0.118
VOCs	Trichloroethene	79-01-6	85	0	0%	0.122	0.108	-	-	0.116
VOCs	Trichlorofluoromethane	75-69-4	85	0	0%	0.099	0.088	-	-	0.100
VOCs	1,2,3-Trichloropropane	96-18-4	13	0	0%	0.293	0.174	-	-	0.472
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	85	0	0%	0.135	0.139	-	-	0.121
VOCs	1,2,4-Trimethylbenzene	95-63-6	13	0	0%	0.173	0.086	-	-	0.290
VOCs	1,3,5-Trimethylbenzene	108-67-8	13	0	0%	0.123	0.086	-	-	0.211
VOCs	Vinyl chloride	75-01-4	85	0	0%	0.115	0.112	-	-	0.114
VOCs	m, p-Xylene	179601-23-1	85	0	0%	0.083	0.073	-	-	0.084
VOCs	o-Xylene	95-47-6	85	0	0%	0.087	0.083	-	-	0.091

Notes:

SVOCs: Semi volatile organic compounds

VOCs: Volatile organic compounds

MDL: Method detection limit

µg/L: Microgram per liter

Table A-3. Sediment Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
Metals	Antimony	7440-36-0	17	4	24%	0.808	1.832	SEDRYN02-202305-0006-01	6.050	0.091
Metals	Arsenic	7440-38-2	17	17	100%	2.663	1.594	SEDRYN02-202305-0006-01	5.500	0.086
Metals	Barium	7440-39-3	17	17	100%	54.725	39.898	SEDRYN02-202305-0006-01	145.000	0.397
Metals	Beryllium	7440-41-7	17	12	71%	0.157	0.110	SEDRYN02-202305-0006-01	0.430	0.084
Metals	Cadmium	7440-43-9	17	16	94%	0.451	0.412	SEDRYN10-202305-0006-01	1.500	0.085
Metals	Chromium	7440-47-3	17	17	100%	4.300	2.315	SEDRYN10-202305-0006-01	9.900	0.161
Metals	Cobalt	7440-48-4	17	17	100%	2.396	1.052	SEDRYN10-202305-0006-01	4.700	0.055
Metals	Copper	7440-50-8	17	17	100%	11.038	12.222	SEDRYN02-202305-0006-01	48.500	0.123
Metals	Lead	7439-92-1	17	17	100%	28.556	49.510	SEDRYN02-202305-0006-01	207.000	0.081
Metals	Manganese	7439-96-5	17	17	100%	215.938	163.187	SEDRYN02-202305-0006-01	590.000	0.161
Metals	Mercury	7439-97-6	11	5	45%	0.017	0.023	SEDRYN10-202305-0006-01	0.081	0.011
Metals	Nickel	7440-02-0	17	17	100%	6.075	3.392	SEDRYN10-202305-0006-01	14.000	0.152
Metals	Selenium	7782-49-2	17	16	94%	3.421	3.192	SEDRYN10-202305-0006-01	14.000	0.669
Metals	Silver	7440-22-4	17	13	76%	0.114	0.161	SEDRYN02-202305-0006-01	0.660	0.032
Metals	Thallium	7440-28-0	17	13	76%	0.108	0.105	SEDRYN10-202305-0006-01	0.450	0.042
Metals	Vanadium	7440-62-2	17	17	100%	11.650	5.613	SEDRYN02-202305-0006-01	21.000	0.141
Metals	Zinc	7440-66-6	17	17	100%	165.700	370.433	SEDRYN02-202305-0006-01	1,540.000	0.336
SVOCs	1,1'-Biphenyl	92-52-4	18	0	0%	0.021	0.015	-	-	0.040
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	18	0	0%	0.025	0.017	-	-	0.047
SVOCs	1,4-Dioxane	123-91-1	18	0	0%	0.017	0.011	-	-	0.032
SVOCs	1-Methylnaphthalene	90-12-0	14	0	0%	0.000	0.000	-	-	0.001
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	18	0	0%	0.045	0.036	-	-	0.085
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	18	0	0%	0.024	0.017	-	-	0.047
SVOCs	2,4,5-Trichlorophenol	95-95-4	18	0	0%	0.026	0.019	-	-	0.049
SVOCs	2,4,6-Trichlorophenol	88-06-2	18	0	0%	0.025	0.017	-	-	0.048
SVOCs	2,4-Dichlorophenol	120-83-2	18	0	0%	0.022	0.014	-	-	0.042
SVOCs	2,4-Dimethylphenol	105-67-9	18	0	0%	0.034	0.022	-	-	0.064
SVOCs	2,4-Dinitrophenol	51-28-5	18	0	0%	0.042	0.031	-	-	0.079
SVOCs	2,4-Dinitrotoluene	121-14-2	18	0	0%	0.027	0.020	-	-	0.052

Table A-3. Sediment Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
SVOCs	2,6-Dinitrotoluene	606-20-2	18	0	0%	0.021	0.015	-	-	0.040
SVOCs	2-Chloronaphthalene	91-58-7	18	0	0%	0.025	0.017	-	-	0.047
SVOCs	2-Chlorophenol	95-57-8	18	0	0%	0.021	0.015	-	-	0.040
SVOCs	2-Methylnaphthalene	91-57-6	18	4	22%	0.003	0.010	SED009-201903-0006-01	0.039	0.001
SVOCs	2-Methylphenol	95-48-7	18	0	0%	0.024	0.018	-	-	0.045
SVOCs	2-Nitroaniline	88-74-4	18	0	0%	0.035	0.027	-	-	0.066
SVOCs	2-Nitrophenol	88-75-5	18	0	0%	0.029	0.021	-	-	0.056
SVOCs	3,3'-Dichlorobenzidine	91-94-1	18	0	0%	0.046	0.027	-	-	0.089
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	4	0	0%	0.009	0.001	-	-	0.017
SVOCs	3-Nitroaniline	99-09-2	18	0	0%	0.023	0.016	-	-	0.044
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	18	0	0%	0.048	0.036	-	-	0.090
SVOCs	4-Bromophenyl-phenylether	101-55-3	18	0	0%	0.022	0.015	-	-	0.041
SVOCs	4-Chloro-3-methylphenol	59-50-7	18	0	0%	0.027	0.019	-	-	0.051
SVOCs	4-Chloroaniline	106-47-8	18	0	0%	0.031	0.022	-	-	0.060
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	18	0	0%	0.022	0.015	-	-	0.041
SVOCs	4-Methylphenol	106-44-5	14	4	29%	0.146	0.267	SEDRYN06-202305-0006-01	0.940	0.063
SVOCs	4-Nitroaniline	100-01-6	18	0	0%	0.037	0.025	-	-	0.070
SVOCs	4-Nitrophenol	100-02-7	18	0	0%	0.035	0.024	-	-	0.066
SVOCs	Acenaphthene	83-32-9	18	4	22%	0.001	0.001	SED009-201903-0006-01	0.004	0.001
SVOCs	Acenaphthylene	208-96-8	18	5	28%	0.001	0.001	SED009-201903-0612-01	0.003	0.001
SVOCs	Acetophenone	98-86-2	18	11	61%	0.160	0.124	SEDRYN10-202305-0006-01	0.410	0.064
SVOCs	Anthracene	120-12-7	18	6	33%	0.001	0.002	SEDRYN02-202305-0006-01	0.006	0.001
SVOCs	Atrazine	1912-24-9	18	0	0%	0.039	0.029	-	-	0.075
SVOCs	Benzaldehyde	100-52-7	18	0	0%	0.037	0.027	-	-	0.069
SVOCs	Benzo(a)anthracene	56-55-3	18	13	72%	0.008	0.015	SEDRYN02-202305-0006-01	0.052	0.001
SVOCs	Benzo(a)pyrene	50-32-8	18	7	39%	0.010	0.018	SEDRYN02-202305-0006-01	0.057	0.002
SVOCs	Benzo(b)fluoranthene	205-99-2	18	14	78%	0.013	0.022	SEDRYN02-202305-0006-01	0.079	0.001
SVOCs	Benzo(g,h,i)perylene	191-24-2	18	9	50%	0.007	0.013	SEDRYN02-202305-0006-01	0.047	0.001
SVOCs	Benzo(k)fluoranthene	207-08-9	18	8	44%	0.005	0.009	SED009-201903-0006-01	0.028	0.001

Table A-3. Sediment Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	18	0	0%	0.022	0.014	-	-	0.042
SVOCs	Bis(2-Chloroethyl)ether	111-44-4	18	0	0%	0.028	0.019	-	-	0.054
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	18	3	17%	0.082	0.177	SEDRYN03-202305-0006-01	0.740	0.064
SVOCs	Butylbenzylphthalate	85-68-7	18	0	0%	0.021	0.013	-	-	0.040
SVOCs	Caprolactam	105-60-2	18	0	0%	0.051	0.039	-	-	0.096
SVOCs	Carbazole	86-74-8	18	0	0%	0.030	0.021	-	-	0.056
SVOCs	Chrysene	218-01-9	18	13	72%	0.010	0.018	SEDRYN02-202305-0006-01	0.065	0.001
SVOCs	Dibenzo(a,h)anthracene	53-70-3	18	2	11%	0.001	0.003	SEDRYN02-202305-0006-01	0.012	0.001
SVOCs	Dibenzofuran	132-64-9	18	0	0%	0.025	0.017	-	-	0.047
SVOCs	Diethylphthalate	84-66-2	18	0	0%	0.018	0.012	-	-	0.035
SVOCs	Dimethylphthalate	131-11-3	18	0	0%	0.018	0.012	-	-	0.035
SVOCs	Di-n-butylphthalate	84-74-2	18	0	0%	0.022	0.015	-	-	0.042
SVOCs	Di-n-octylphthalate	117-84-0	18	1	6%	0.032	0.017	SEDRYN03-202305-0006-01	0.040	0.061
SVOCs	Fluoranthene	206-44-0	18	17	94%	0.018	0.035	SEDRYN02-202305-0006-01	0.126	0.001
SVOCs	Fluorene	86-73-7	18	4	22%	0.001	0.001	SED009-201903-0612-01	0.003	0.001
SVOCs	Hexachlorobenzene	118-74-1	18	0	0%	0.026	0.019	-	-	0.049
SVOCs	Hexachlorobutadiene	87-68-3	18	0	0%	0.027	0.020	-	-	0.052
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	18	0	0%	0.058	0.045	-	-	0.110
SVOCs	Hexachloroethane	67-72-1	18	0	0%	0.019	0.014	-	-	0.036
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	18	8	44%	0.007	0.012	SEDRYN02-202305-0006-01	0.044	0.001
SVOCs	Isophorone	78-59-1	18	0	0%	0.023	0.016	-	-	0.044
SVOCs	Naphthalene	91-20-3	18	5	28%	0.002	0.005	SED009-201903-0006-01	0.019	0.001
SVOCs	Nitrobenzene	98-95-3	18	0	0%	0.038	0.029	-	-	0.072
SVOCs	N-Nitroso-di-n propylamine	621-64-7	18	0	0%	0.032	0.023	SEDRYN05-202305-0006-01; SEDRYN09-202305-0006-01	-	0.061
SVOCs	N-Nitrosodiphenylamine	86-30-6	18	0	0%	0.025	0.019	-	-	0.048
SVOCs	Pentachlorophenol	87-86-5	18	1	6%	0.004	0.009	SED021-201904-0006-01	0.036	0.003
SVOCs	Phenanthrene	85-01-8	18	13	72%	0.006	0.011	SEDRYN02-202305-0006-01	0.037	0.001
SVOCs	Phenol	108-95-2	18	4	22%	0.042	0.029	SEDRYN05-202305-0006-01	0.089	0.060

Table A-3. Sediment Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
SVOCs	Pyrene	129-00-0	18	14	78%	0.017	0.032	SEDRYN02-202305-0006-01	0.113	0.001
VOCs	1,1,1-Trichloroethane	71-55-6	18	0	0%	0.002	0.001	-	-	0.003
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	18	0	0%	0.002	0.002	-	-	0.003
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	18	0	0%	0.002	0.002	-	-	0.004
VOCs	1,1,2-Trichloroethane	79-00-5	18	0	0%	0.002	0.001	-	-	0.003
VOCs	1,1-Dichloroethane	75-34-3	18	0	0%	0.002	0.002	-	-	0.003
VOCs	1,1-Dichloroethene	75-35-4	18	0	0%	0.002	0.002	-	-	0.004
VOCs	1,2,3-Trichlorobenzene	87-61-6	18	0	0%	0.001	0.001	-	-	0.003
VOCs	1,2,3-Trichloropropane	96-18-4	14	0	0%	0.002	0.002	-	-	0.004
VOCs	1,2,4-Trichlorobenzene	120-82-1	18	0	0%	0.001	0.001	-	-	0.003
VOCs	1,2,4-Trimethylbenzene	95-63-6	14	0	0%	0.001	0.001	-	-	0.003
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	18	0	0%	0.002	0.002	-	-	0.003
VOCs	1,2-Dibromoethane	106-93-4	18	0	0%	0.001	0.002	-	-	0.003
VOCs	1,2-Dichlorobenzene	95-50-1	18	0	0%	0.002	0.002	-	-	0.003
VOCs	1,2-Dichloroethane	107-06-2	18	0	0%	0.002	0.002	-	-	0.003
VOCs	1,2-Dichloropropane	78-87-5	18	0	0%	0.002	0.002	-	-	0.003
VOCs	1,3,5-Trimethylbenzene	108-67-8	14	0	0%	0.001	0.001	-	-	0.003
VOCs	1,3-Dichlorobenzene	541-73-1	18	0	0%	0.001	0.001	-	-	0.003
VOCs	1,4-Dichlorobenzene	106-46-7	18	0	0%	0.002	0.002	-	-	0.003
VOCs	2-Butanone	78-93-3	18	4	22%	0.010	0.014	SEDRYN10-202305-0006-01	0.060	0.011
VOCs	2-Hexanone	591-78-6	18	0	0%	0.003	0.003	-	-	0.006
VOCs	4-Methyl-2-pentanone	108-10-1	18	0	0%	0.003	0.003	-	-	0.005
VOCs	Acetone	67-64-1	18	12	67%	0.050	0.080	SEDRYN10-202305-0006-01	0.250	0.012
VOCs	Benzene	71-43-2	18	0	0%	0.002	0.002	-	-	0.003
VOCs	Bromochloromethane	74-97-5	18	0	0%	0.002	0.002	-	-	0.003
VOCs	Bromodichloromethane	75-27-4	18	0	0%	0.001	0.002	-	-	0.003
VOCs	Bromoform	75-25-2	18	0	0%	0.001	0.001	-	-	0.003
VOCs	Bromomethane	74-83-9	18	0	0%	0.002	0.002	-	-	0.003
VOCs	Carbon disulfide	75-15-0	18	0	0%	0.002	0.002	-	-	0.003

Table A-3. Sediment Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
VOCs	Carbon tetrachloride	56-23-5	18	0	0%	0.002	0.001	-	-	0.003
VOCs	Chlorobenzene	108-90-7	18	0	0%	0.001	0.002	-	-	0.003
VOCs	Chloroethane	75-00-3	18	0	0%	0.002	0.002	-	-	0.004
VOCs	Chloroform	67-66-3	18	0	0%	0.002	0.002	-	-	0.003
VOCs	Chloromethane	74-87-3	18	0	0%	0.002	0.002	-	-	0.003
VOCs	cis-1,2-Dichloroethene	156-59-2	18	0	0%	0.002	0.002	-	-	0.003
VOCs	cis-1,3-Dichloropropene	10061-01-5	18	0	0%	0.001	0.002	-	-	0.003
VOCs	Cyclohexane	110-82-7	18	0	0%	0.002	0.001	-	-	0.003
VOCs	Dibromochloromethane	124-48-1	18	0	0%	0.001	0.001	-	-	0.003
VOCs	Dichlorodifluoromethane	75-71-8	18	0	0%	0.002	0.001	-	-	0.003
VOCs	Ethylbenzene	100-41-4	18	0	0%	0.001	0.001	-	-	0.003
VOCs	Isopropylbenzene	98-82-8	18	0	0%	0.001	0.001	-	-	0.003
VOCs	m,p-Xylene	179601-23-1	0	0	-	-	-	-	-	-
VOCs	Methyl acetate	79-20-9	18	0	0%	0.002	0.002	-	-	0.003
VOCs	Methyl tert-butyl ether	1634-04-4	18	0	0%	0.001	0.002	-	-	0.003
VOCs	Methylcyclohexane	108-87-2	18	0	0%	0.002	0.001	-	-	0.003
VOCs	Methylene chloride	75-09-2	18	3	17%	0.006	0.013	SEDRYN10-202305-0006-01	0.053	0.007
VOCs	o-Xylene	95-47-6	18	0	0%	0.001	0.001	-	-	0.002
VOCs	Styrene	100-42-5	18	0	0%	0.001	0.001	-	-	0.002
VOCs	Tetrachloroethene	127-18-4	18	0	0%	0.002	0.003	-	-	0.005
VOCs	Toluene	108-88-3	18	2	11%	0.002	0.002	SED017-201903-0006-01	0.002	0.003
VOCs	trans-1,2-Dichloroethene	156-60-5	18	0	0%	0.002	0.002	-	-	0.003
VOCs	trans-1,3-Dichloropropene	10061-02-6	18	0	0%	0.002	0.002	-	-	0.003
VOCs	Trichloroethene	79-01-6	18	0	0%	0.002	0.001	-	-	0.003
VOCs	Trichlorofluoromethane	75-69-4	18	0	0%	0.002	0.002	-	-	0.004
VOCs	Vinyl chloride	75-01-4	18	0	0%	0.002	0.002	-	-	0.004

Table A-3. Sediment Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Notes:

SVOCs: Semi volatile organic compounds

VOCs: Volatile organic compounds

MDL: Method detection limit

mg/kg: Milligram per kilogram

Table A-4. Sediment Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
Metals	Antimony	7440-36-0	28	27	96%	4.715	7.672	SED006-201904-0612-01	29.895	0.386
Metals	Arsenic	7440-38-2	28	28	100%	45.639	100.967	SED005-201904-0006-01	416.000	0.239
Metals	Barium	7440-39-3	28	28	100%	315.917	311.037	SED005-201904-0006-01	1,340.000	1.898
Metals	Beryllium	7440-41-7	28	25	89%	0.421	0.210	SED010-201904-0006-01	0.810	0.231
Metals	Cadmium	7440-43-9	28	27	96%	4.759	4.163	SED014-201903-0612-01	14.000	0.184
Metals	Chromium	7440-47-3	28	28	100%	15.229	11.585	SED001-201904-0612-01	37.100	0.445
Metals	Cobalt	7440-48-4	28	28	100%	5.314	2.712	SED014-201903-0006-01	11.100	0.211
Metals	Copper	7440-50-8	28	28	100%	228.896	610.438	SED005-201904-0006-01	2,505.000	0.741
Metals	Lead	7439-92-1	28	28	100%	733.447	1,658.418	SED005-201904-0006-01	6,800.000	0.478
Metals	Manganese	7439-96-5	28	28	100%	1,763.506	2,010.968	SED002-201903-0006-01	7,700.000	0.869
Metals	Mercury	7439-97-6	28	26	93%	0.141	0.125	SED014-201903-0612-01	0.460	0.010
Metals	Nickel	7440-02-0	28	28	100%	21.323	12.625	SED002-201903-0006-01	53.900	0.291
Metals	Selenium	7782-49-2	28	28	100%	17.874	19.940	SED018-201903-0612-01	72.800	1.117
Metals	Silver	7440-22-4	28	26	93%	2.913	7.655	SED005-201904-0006-01	31.400	0.163
Metals	Thallium	7440-28-0	28	23	82%	0.436	0.300	SED002-201903-0612-01	1.100	0.165
Metals	Vanadium	7440-62-2	28	28	100%	37.411	26.053	SED001-201904-0612-01	114.000	0.704
Metals	Zinc	7440-66-6	28	28	100%	1,617.288	2,751.683	SED005-201904-0006-01	10,600.000	2.135
SVOCs	1,1'-Biphenyl	92-52-4	28	0	0%	0.023	0.018	-	-	0.039
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	28	0	0%	0.026	0.019	-	-	0.044
SVOCs	1,4-Dioxane	123-91-1	28	0	0%	0.017	0.010	-	-	0.029
SVOCs	1-Methylnaphthalene	90-12-0	9	2	22%	0.003	0.002	SED012-202504-0612-01-V	0.005	0.003
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	28	0	0%	0.020	0.014	-	-	0.033
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	28	0	0%	0.027	0.021	-	-	0.046
SVOCs	2,4,5-Trichlorophenol	95-95-4	28	0	0%	0.023	0.020	-	-	0.038
SVOCs	2,4,6-Trichlorophenol	88-06-2	28	0	0%	0.029	0.021	-	-	0.049
SVOCs	2,4-Dichlorophenol	120-83-2	28	0	0%	0.027	0.016	-	-	0.046
SVOCs	2,4-Dimethylphenol	105-67-9	28	0	0%	0.034	0.018	-	-	0.057
SVOCs	2,4-Dinitrophenol	51-28-5	28	0	0%	0.029	0.019	-	-	0.048
SVOCs	2,4-Dinitrotoluene	121-14-2	28	0	0%	0.029	0.022	-	-	0.048

Table A-4. Sediment Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
SVOCs	2,6-Dinitrotoluene	606-20-2	28	0	0%	0.024	0.021	-	-	0.040
SVOCs	2-Chloronaphthalene	91-58-7	28	0	0%	0.025	0.020	-	-	0.042
SVOCs	2-Chlorophenol	95-57-8	28	0	0%	0.023	0.016	-	-	0.039
SVOCs	2-Methylnaphthalene	91-57-6	28	19	68%	0.012	0.017	SED020-201904-0612-01	0.055	0.001
SVOCs	2-Methylphenol	95-48-7	28	1	4%	0.020	0.017	SED006-201904-0612-01	0.054	0.029
SVOCs	2-Nitroaniline	88-74-4	28	0	0%	0.025	0.022	-	-	0.041
SVOCs	2-Nitrophenol	88-75-5	28	0	0%	0.029	0.018	-	-	0.049
SVOCs	3,3'-Dichlorobenzidine	91-94-1	28	0	0%	0.058	0.030	-	-	0.097
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	28	2	7%	0.041	0.092	SED001-201904-0612-01	0.380	0.025
SVOCs	3-Nitroaniline	99-09-2	28	0	0%	0.026	0.016	-	-	0.045
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	28	0	0%	0.030	0.019	-	-	0.051
SVOCs	4-Bromophenyl-phenylether	101-55-3	28	0	0%	0.025	0.022	-	-	0.043
SVOCs	4-Chloro-3-methylphenol	59-50-7	28	0	0%	0.024	0.016	-	-	0.041
SVOCs	4-Chloroaniline	106-47-8	28	0	0%	0.030	0.018	-	-	0.050
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	28	0	0%	0.023	0.018	-	-	0.039
SVOCs	4-Methylphenol	106-44-5	9	1	11%	0.974	2.083	SED005-202504-0006-01-V	4.700	0.094
SVOCs	4-Nitroaniline	100-01-6	28	0	0%	0.036	0.022	-	-	0.061
SVOCs	4-Nitrophenol	100-02-7	28	0	0%	0.034	0.020	-	-	0.057
SVOCs	Acenaphthene	83-32-9	28	21	75%	0.018	0.026	SED014-201903-0006-01	0.082	0.001
SVOCs	Acenaphthylene	208-96-8	28	26	93%	0.013	0.014	SED004-201903-0006-01	0.053	0.001
SVOCs	Acetophenone	98-86-2	28	1	4%	0.040	0.063	SED014-201903-0006-01	0.270	0.041
SVOCs	Anthracene	120-12-7	28	27	96%	0.042	0.057	SED004-201903-0006-01	0.190	0.002
SVOCs	Atrazine	1912-24-9	28	0	0%	0.030	0.023	-	-	0.051
SVOCs	Benzaldehyde	100-52-7	28	2	7%	0.038	0.038	SED014-201903-0006-01	0.160	0.050
SVOCs	Benzo(a)anthracene	56-55-3	28	28	100%	0.119	0.140	SED004-201903-0006-01	0.520	0.004
SVOCs	Benzo(a)pyrene	50-32-8	28	28	100%	0.127	0.137	SED004-201903-0006-01	0.510	0.004
SVOCs	Benzo(b)fluoranthene	205-99-2	28	28	100%	0.164	0.158	SED004-201903-0006-01	0.580	0.006
SVOCs	Benzo(g,h,i)perylene	191-24-2	28	28	100%	0.093	0.091	SED004-201903-0006-01	0.350	0.005
SVOCs	Benzo(k)fluoranthene	207-08-9	28	28	100%	0.070	0.072	SED004-201903-0006-01	0.270	0.003

Table A-4. Sediment Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	28	0	0%	0.027	0.017	-	-	0.047
SVOCs	Bis(2-Chloroethyl)ether	111-44-4	28	0	0%	0.028	0.018	-	-	0.048
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	28	12	43%	0.089	0.087	SED001-201904-0612-01	0.280	0.036
SVOCs	Butylbenzylphthalate	85-68-7	28	4	14%	0.034	0.020	SED012-201904-0006-01	0.057	0.050
SVOCs	Caprolactam	105-60-2	28	0	0%	0.027	0.021	-	-	0.046
SVOCs	Carbazole	86-74-8	28	3	11%	0.036	0.029	SED003-201903-0612-01	0.110	0.045
SVOCs	Chrysene	218-01-9	28	28	100%	0.130	0.133	SED004-201903-0006-01	0.490	0.004
SVOCs	Dibenzo(a,h)anthracene	53-70-3	28	4	14%	0.001	0.003	SED012-201904-0006-01	0.012	0.001
SVOCs	Dibenzofuran	132-64-9	28	2	7%	0.029	0.020	SED014-201903-0006-01	0.053	0.042
SVOCs	Diethylphthalate	84-66-2	28	0	0%	0.026	0.019	-	-	0.044
SVOCs	Dimethylphthalate	131-11-3	28	0	0%	0.025	0.019	-	-	0.042
SVOCs	Di-n-butylphthalate	84-74-2	28	0	0%	0.026	0.021	-	-	0.043
SVOCs	Di-n-octylphthalate	117-84-0	28	0	0%	0.079	0.042	-	-	0.131
SVOCs	Fluoranthene	206-44-0	28	28	100%	0.278	0.384	SED004-201903-0006-01	1.500	0.005
SVOCs	Fluorene	86-73-7	28	15	54%	0.014	0.024	SED003-201903-0612-01	0.068	0.002
SVOCs	Hexachlorobenzene	118-74-1	28	0	0%	0.024	0.022	-	-	0.040
SVOCs	Hexachlorobutadiene	87-68-3	28	0	0%	0.025	0.017	-	-	0.043
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	28	0	0%	0.029	0.022	-	-	0.046
SVOCs	Hexachloroethane	67-72-1	28	0	0%	0.020	0.015	-	-	0.033
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	28	28	100%	0.083	0.083	SED004-201903-0006-01	0.310	0.004
SVOCs	Isophorone	78-59-1	28	0	0%	0.023	0.016	-	-	0.038
SVOCs	Naphthalene	91-20-3	28	21	75%	0.017	0.032	SED014-201903-0006-01	0.130	0.002
SVOCs	Nitrobenzene	98-95-3	28	0	0%	0.024	0.017	-	-	0.041
SVOCs	N-Nitroso-di-n propylamine	621-64-7	28	3	11%	0.054	0.105	SED005-201904-0006-01	0.442	0.049
SVOCs	N-Nitrosodiphenylamine	86-30-6	28	0	0%	0.025	0.020	-	-	0.042
SVOCs	Pentachlorophenol	87-86-5	28	16	57%	0.009	0.008	SED014-201903-0006-01	0.027	0.004
SVOCs	Phenanthrene	85-01-8	28	27	96%	0.165	0.234	SED004-201903-0006-01	0.790	0.005
SVOCs	Phenol	108-95-2	28	4	14%	0.037	0.034	SED005-201904-0006-01	0.138	0.046
SVOCs	Pyrene	129-00-0	28	28	100%	0.222	0.262	SED004-201903-0006-01	1.000	0.005

Table A-4. Sediment Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
VOCs	1,1,1-Trichloroethane	71-55-6	28	0	0%	0.003	0.003	-	-	0.004
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	28	0	0%	0.003	0.003	-	-	0.004
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	28	0	0%	0.004	0.004	-	-	0.006
VOCs	1,1,2-Trichloroethane	79-00-5	28	0	0%	0.002	0.002	-	-	0.003
VOCs	1,1-Dichloroethane	75-34-3	28	0	0%	0.002	0.003	-	-	0.003
VOCs	1,1-Dichloroethene	75-35-4	28	0	0%	0.003	0.004	-	-	0.005
VOCs	1,2,3-Trichlorobenzene	87-61-6	27	0	0%	0.002	0.002	-	-	0.003
VOCs	1,2,3-Trichloropropane	96-18-4	9	0	0%	0.004	0.004	-	-	0.007
VOCs	1,2,4-Trichlorobenzene	120-82-1	27	0	0%	0.002	0.003	-	-	0.004
VOCs	1,2,4-Trimethylbenzene	95-63-6	9	0	0%	0.002	0.002	-	-	0.004
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	27	0	0%	0.002	0.003	-	-	0.003
VOCs	1,2-Dibromoethane	106-93-4	28	0	0%	0.002	0.002	-	-	0.003
VOCs	1,2-Dichlorobenzene	95-50-1	27	0	0%	0.002	0.003	-	-	0.003
VOCs	1,2-Dichloroethane	107-06-2	28	0	0%	0.002	0.003	-	-	0.003
VOCs	1,2-Dichloropropane	78-87-5	28	0	0%	0.001	0.001	-	-	0.002
VOCs	1,3,5-Trimethylbenzene	108-67-8	9	0	0%	0.002	0.002	-	-	0.003
VOCs	1,3-Dichlorobenzene	541-73-1	27	0	0%	0.002	0.002	-	-	0.003
VOCs	1,4-Dichlorobenzene	106-46-7	27	0	0%	0.002	0.002	-	-	0.003
VOCs	2-Butanone	78-93-3	28	15	54%	0.020	0.022	SED002-201903-0006-01	0.054	0.012
VOCs	2-Hexanone	591-78-6	28	5	18%	0.009	0.012	SED018-201903-0612-01	0.019	0.009
VOCs	4-Methyl-2-pentanone	108-10-1	28	0	0%	0.005	0.005	-	-	0.007
VOCs	Acetone	67-64-1	28	20	71%	0.036	0.032	SED002-201903-0006-01	0.110	0.016
VOCs	Benzene	71-43-2	28	0	0%	0.002	0.002	-	-	0.003
VOCs	Bromochloromethane	74-97-5	28	0	0%	0.002	0.003	-	-	0.003
VOCs	Bromodichloromethane	75-27-4	28	0	0%	0.002	0.002	-	-	0.003
VOCs	Bromoform	75-25-2	27	0	0%	0.002	0.002	-	-	0.003
VOCs	Bromomethane	74-83-9	28	0	0%	0.003	0.004	-	-	0.004
VOCs	Carbon disulfide	75-15-0	28	3	11%	0.003	0.003	SED001-201904-0612-01	0.008	0.004
VOCs	Carbon tetrachloride	56-23-5	28	0	0%	0.003	0.003	-	-	0.004

Table A-4. Sediment Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
VOCs	Chlorobenzene	108-90-7	28	0	0%	0.002	0.003	-	-	0.003
VOCs	Chloroethane	75-00-3	28	0	0%	0.004	0.003	-	-	0.006
VOCs	Chloroform	67-66-3	28	2	7%	0.003	0.003	SED001-201904-0006-01	0.004	0.004
VOCs	Chloromethane	74-87-3	28	0	0%	0.003	0.003	-	-	0.004
VOCs	cis-1,2-Dichloroethene	156-59-2	28	0	0%	0.002	0.003	-	-	0.003
VOCs	cis-1,3-Dichloropropene	10061-01-5	28	0	0%	0.002	0.002	-	-	0.003
VOCs	Cyclohexane	110-82-7	28	0	0%	0.003	0.003	-	-	0.005
VOCs	Dibromochloromethane	124-48-1	28	0	0%	0.002	0.002	-	-	0.003
VOCs	Dichlorodifluoromethane	75-71-8	28	0	0%	0.004	0.002	-	-	0.006
VOCs	Ethylbenzene	100-41-4	28	0	0%	0.002	0.002	-	-	0.003
VOCs	Isopropylbenzene	98-82-8	28	0	0%	0.002	0.002	-	-	0.003
VOCs	m,p-Xylene	179601-23-1	9	0	0%	0.003	0.003	-	-	0.005
VOCs	Methyl acetate	79-20-9	28	1	4%	0.003	0.004	SED010-201904-0006-01-V	0.002	0.004
VOCs	Methyl tert-butyl ether	1634-04-4	28	0	0%	0.002	0.003	-	-	0.003
VOCs	Methylcyclohexane	108-87-2	28	0	0%	0.004	0.003	-	-	0.006
VOCs	Methylene chloride	75-09-2	28	2	7%	0.003	0.004	SED004-201903-0006-01	0.005	0.004
VOCs	o-Xylene	95-47-6	28	0	0%	0.002	0.002	-	-	0.003
VOCs	Styrene	100-42-5	28	0	0%	0.002	0.002	-	-	0.003
VOCs	Tetrachloroethene	127-18-4	28	0	0%	0.002	0.003	-	-	0.004
VOCs	Toluene	108-88-3	28	6	21%	0.004	0.007	SED001-201904-0612-01	0.026	0.003
VOCs	trans-1,2-Dichloroethene	156-60-5	28	0	0%	0.002	0.003	-	-	0.004
VOCs	trans-1,3-Dichloropropene	10061-02-6	28	0	0%	0.003	0.004	-	-	0.004
VOCs	Trichloroethene	79-01-6	28	0	0%	0.002	0.002	-	-	0.003
VOCs	Trichlorofluoromethane	75-69-4	28	0	0%	0.003	0.003	-	-	0.005
VOCs	Vinyl chloride	75-01-4	28	0	0%	0.003	0.002	-	-	0.005

Table A-4. Sediment Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)

Notes:

SVOCs: Semi volatile organic compounds

VOCs: Volatile organic compounds

MDL: Method detection limit

mg/kg: Milligram per kilogram

Table A-5. Pore Water Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
Metals	Aluminum	7429-90-5	14	8	57%	434.973	912.794	PWRYN05-202305-01	3,200.000	71.507
Metals	Antimony	7440-36-0	14	3	21%	0.935	0.719	PWRYN11-202305-01	1.290	1.611
Metals	Arsenic	7440-38-2	14	8	57%	2.153	2.342	PWRYN07-202305-01	7.930	1.137
Metals	Barium	7440-39-3	14	14	100%	89.675	51.946	PWRYN10-202305-01	213.000	1.894
Metals	Beryllium	7440-41-7	14	0	0%	0.852	0.782	-	-	1.705
Metals	Cadmium	7440-43-9	14	1	7%	0.350	0.303	PWRYN05-202305-01	0.426	0.664
Metals	Chromium	7440-47-3	14	1	7%	2.201	1.155	PWRYN05-202305-01	5.450	3.850
Metals	Cobalt	7440-48-4	14	4	29%	0.810	0.698	PWRYN05-202305-01	2.510	0.947
Metals	Copper	7440-50-8	14	3	21%	3.079	2.500	PW022-202305-01	7.870	3.867
Metals	Iron	7439-89-6	14	11	79%	1,196.364	1,972.115	PWRYN05-202305-01	6,090.000	37.886
Metals	Lead	7439-92-1	14	8	57%	2.747	4.804	PWRYN05-202305-01	15.800	0.475
Metals	Manganese	7439-96-5	14	14	100%	231.821	249.229	PWRYN07-202305-01	792.000	1.989
Metals	Mercury	7439-97-6	14	13	93%	0.003	0.005	PWRYN07-202305-01	0.018	0.000
Metals	Nickel	7440-02-0	14	3	21%	3.016	2.503	PWRYN05-202305-01	8.230	4.539
Metals	Selenium	7782-49-2	14	11	79%	5.993	7.552	PW009-20190308-01	29.700	1.705
Metals	Silver	7440-22-4	14	0	0%	0.332	0.305	-	-	0.664
Metals	Thallium	7440-28-0	14	0	0%	0.616	0.566	-	-	1.232
Metals	Vanadium	7440-62-2	14	6	43%	3.149	3.872	PWRYN05-202305-01	15.200	2.474
Metals	Zinc	7440-66-6	14	3	21%	18.657	20.578	PWRYN05-202305-01	80.800	20.986
Metals, Diss	Aluminum	7429-90-5	14	4	29%	45.002	18.202	PWRYN01-202305-01	70.700	71.507
Metals, Diss	Antimony	7440-36-0	14	3	21%	1.083	0.828	PWRYN03-202305-01	2.420	1.611
Metals, Diss	Arsenic	7440-38-2	14	8	57%	1.914	2.064	PWRYN07-202305-01	8.080	1.137
Metals, Diss	Barium	7440-39-3	14	14	100%	76.036	43.405	PWRYN10-202305-01	210.000	1.894
Metals, Diss	Beryllium	7440-41-7	14	0	0%	0.852	0.782	-	-	1.705
Metals, Diss	Cadmium	7440-43-9	14	0	0%	0.332	0.305	-	-	0.664
Metals, Diss	Chromium	7440-47-3	14	0	0%	1.925	0.686	-	-	3.850
Metals, Diss	Cobalt	7440-48-4	14	2	14%	0.582	0.493	PWRYN07-202305-01	1.450	0.947
Metals, Diss	Copper	7440-50-8	14	1	7%	2.139	1.776	PW022-202305-01	3.950	3.867
Metals, Diss	Iron	7439-89-6	14	5	36%	373.150	1,062.660	PWRYN07-202305-01	4,030.000	37.886

Table A-5. Pore Water Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
Metals, Diss	Lead	7439-92-1	14	2	14%	0.521	0.963	PWRYN01-202305-01	3.780	0.475
Metals, Diss	Manganese	7439-96-5	14	13	93%	195.747	218.121	PWRYN07-202305-01	753.000	1.989
Metals, Diss	Mercury	7439-97-6	14	5	36%	0.001	0.003	PWRYN07-202305-01	0.012	0.000
Metals, Diss	Nickel	7440-02-0	14	1	7%	2.389	2.059	PWRYN07-202305-01	2.890	4.539
Metals, Diss	Selenium	7782-49-2	14	14	100%	7.072	8.144	PW009-20190308-01	30.500	1.705
Metals, Diss	Silver	7440-22-4	14	0	0%	0.332	0.305	-	-	0.664
Metals, Diss	Thallium	7440-28-0	14	0	0%	0.616	0.566	-	-	1.232
Metals, Diss	Vanadium	7440-62-2	14	5	36%	1.819	1.100	PWRYN12-202305-01	3.510	2.474
Metals, Diss	Zinc	7440-66-6	14	1	7%	11.086	8.114	PWRYN01-202305-01	14.700	20.986
SVOCs	Acenaphthene	83-32-9	14	0	0%	0.007	0.002	-	-	0.014
SVOCs	Acenaphthylene	208-96-8	14	0	0%	0.010	0.003	-	-	0.020
SVOCs	Acetophenone	98-86-2	14	0	0%	0.658	0.182	-	-	1.316
SVOCs	Anthracene	120-12-7	14	0	0%	0.008	0.002	-	-	0.016
SVOCs	Atrazine	1912-24-9	14	0	0%	0.669	0.162	-	-	1.337
SVOCs	Benzaldehyde	100-52-7	14	0	0%	0.541	0.117	-	-	1.082
SVOCs	Benzo(a)anthracene	56-55-3	14	0	0%	0.006	0.001	-	-	0.012
SVOCs	Benzo(a)pyrene	50-32-8	14	0	0%	0.017	0.006	-	-	0.034
SVOCs	Benzo(b)fluoranthene	205-99-2	14	0	0%	0.008	0.001	-	-	0.017
SVOCs	Benzo(g,h,i)perylene	191-24-2	14	0	0%	0.013	0.001	-	-	0.025
SVOCs	Benzo(k)fluoranthene	207-08-9	14	0	0%	0.006	0.001	-	-	0.012
SVOCs	1,1'-Biphenyl	92-52-4	14	0	0%	0.381	0.048	-	-	0.761
SVOCs	4-Bromophenyl-phenylether	101-55-3	14	0	0%	0.370	0.029	-	-	0.741
SVOCs	Butylbenzylphthalate	85-68-7	14	0	0%	0.338	0.007	-	-	0.676
SVOCs	Caprolactam	105-60-2	14	0	0%	1.150	0.199	-	-	2.300
SVOCs	Carbazole	86-74-8	14	0	0%	0.526	0.146	-	-	1.053
SVOCs	4-Chloroaniline	106-47-8	14	0	0%	0.532	0.136	-	-	1.064
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	14	0	0%	0.389	0.072	-	-	0.778
SVOCs	Bis(2-Chloroethyl) ether	111-44-4	14	0	0%	0.530	0.138	-	-	1.061
SVOCs	4-Chloro-3-methylphenol	59-50-7	14	0	0%	0.493	0.114	-	-	0.985

Table A-5. Pore Water Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
SVOCs	2-Chloronaphthalene	91-58-7	14	0	0%	0.397	0.065	-	-	0.794
SVOCs	2-Chlorophenol	95-57-8	14	0	0%	0.408	0.084	-	-	0.815
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	14	0	0%	0.375	0.021	-	-	0.749
SVOCs	Chrysene	218-01-9	14	0	0%	0.010	0.001	-	-	0.020
SVOCs	Dibenzo(a,h)anthracene	53-70-3	14	0	0%	0.009	0.003	-	-	0.017
SVOCs	Dibenzofuran	132-64-9	14	0	0%	0.413	0.074	-	-	0.826
SVOCs	3,3'-Dichlorobenzidine	91-94-1	14	0	0%	0.525	0.050	-	-	1.050
SVOCs	2,4-Dichlorophenol	120-83-2	14	0	0%	0.416	0.048	-	-	0.831
SVOCs	Diethylphthalate	84-66-2	14	0	0%	0.260	0.039	-	-	0.519
SVOCs	2,4-Dimethylphenol	105-67-9	14	0	0%	0.614	0.172	-	-	1.227
SVOCs	Dimethylphthalate	131-11-3	14	0	0%	0.298	0.045	-	-	0.595
SVOCs	Di-n-butylphthalate	84-74-2	14	0	0%	0.221	0.051	-	-	0.441
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	14	0	0%	0.896	0.307	-	-	1.791
SVOCs	2,4-Dinitrophenol	51-28-5	14	0	0%	0.839	0.321	-	-	1.677
SVOCs	2,4-Dinitrotoluene	121-14-2	14	0	0%	0.422	0.036	-	-	0.844
SVOCs	2,6-Dinitrotoluene	606-20-2	14	0	0%	0.336	0.027	-	-	0.673
SVOCs	Di-n-octylphthalate	117-84-0	14	0	0%	0.336	0.053	-	-	0.673
SVOCs	1,4-Dioxane	123-91-1	14	0	0%	0.323	0.044	-	-	0.646
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	14	0	0%	0.430	0.049	-	-	0.861
SVOCs	Fluoranthene	206-44-0	14	0	0%	0.011	0.003	-	-	0.022
SVOCs	Fluorene	86-73-7	14	0	0%	0.007	0.001	-	-	0.015
SVOCs	Hexachlorobenzene	118-74-1	14	0	0%	0.313	0.025	-	-	0.625
SVOCs	Hexachlorobutadiene	87-68-3	14	0	0%	0.441	0.097	-	-	0.882
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	14	0	0%	1.221	0.142	-	-	2.443
SVOCs	Hexachloroethane	67-72-1	14	0	0%	0.350	0.011	-	-	0.699
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	14	0	0%	0.011	0.001	-	-	0.022
SVOCs	Isophorone	78-59-1	14	0	0%	0.359	0.042	-	-	0.718
SVOCs	1-Methylnaphthalene	90-12-0	11	0	0%	0.007	0.000	-	-	0.013
SVOCs	2-Methylnaphthalene	91-57-6	14	0	0%	0.007	0.000	-	-	0.014

Table A-5. Pore Water Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
SVOCs	2-Methylphenol	95-48-7	14	0	0%	0.531	0.138	-	-	1.061
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	1	0	0%	0.300	-	-	-	0.600
SVOCs	4-Methylphenol	106-44-5	13	2	15%	1.695	4.018	PWRYN07-202305-01	15.000	0.943
SVOCs	Naphthalene	91-20-3	14	0	0%	0.009	0.003	-	-	0.018
SVOCs	2-Nitroaniline	88-74-4	14	0	0%	0.605	0.189	-	-	1.210
SVOCs	3-Nitroaniline	99-09-2	14	0	0%	0.449	0.062	-	-	0.898
SVOCs	4-Nitroaniline	100-01-6	14	0	0%	0.619	0.162	-	-	1.237
SVOCs	Nitrobenzene	98-95-3	14	0	0%	0.605	0.189	-	-	1.210
SVOCs	2-Nitrophenol	88-75-5	14	0	0%	0.503	0.094	-	-	1.006
SVOCs	4-Nitrophenol	100-02-7	14	0	0%	0.638	0.124	-	-	1.276
SVOCs	N-Nitroso-di-n propylamine	621-64-7	14	0	0%	0.545	0.109	-	-	1.091
SVOCs	N-Nitrosodiphenylamine	86-30-6	14	0	0%	0.393	0.055	-	-	0.785
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	14	0	0%	0.849	0.299	-	-	1.699
SVOCs	Pentachlorophenol	87-86-5	14	0	0%	0.043	0.012	-	-	0.086
SVOCs	Phenanthrene	85-01-8	14	0	0%	0.011	0.001	-	-	0.022
SVOCs	Phenol	108-95-2	14	1	7%	0.802	0.800	PWRYN07-202305-01	3.500	1.204
SVOCs	Pyrene	129-00-0	14	0	0%	0.012	0.002	-	-	0.023
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	14	0	0%	0.441	0.097	-	-	0.882
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	14	0	0%	0.347	0.024	-	-	0.694
SVOCs	2,4,5-Trichlorophenol	95-95-4	14	0	0%	0.391	0.078	-	-	0.781
SVOCs	2,4,6-Trichlorophenol	88-06-2	14	0	0%	0.454	0.091	-	-	0.909
VOCs	Acetone	67-64-1	14	2	14%	3.018	4.344	PWRYN07-202305-01	17.000	3.050
VOCs	Benzene	71-43-2	14	0	0%	0.229	0.110	-	-	0.459
VOCs	Bromochloromethane	74-97-5	14	0	0%	0.239	0.102	-	-	0.477
VOCs	Bromodichloromethane	75-27-4	14	0	0%	0.278	0.133	-	-	0.557
VOCs	Bromoform	75-25-2	14	0	0%	0.481	0.237	-	-	0.962
VOCs	Bromomethane	74-83-9	14	0	0%	0.482	0.234	-	-	0.964
VOCs	2-Butanone	78-93-3	14	1	7%	1.750	2.126	PWRYN07-202305-01	9.100	2.386
VOCs	Carbon disulfide	75-15-0	14	0	0%	0.354	0.171	-	-	0.708

Table A-5. Pore Water Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
VOCs	Carbon tetrachloride	56-23-5	14	0	0%	0.259	0.131	-	-	0.518
VOCs	Chlorobenzene	108-90-7	14	0	0%	0.196	0.098	-	-	0.391
VOCs	Chloroethane	75-00-3	14	0	0%	0.274	0.121	-	-	0.548
VOCs	Chloroform	67-66-3	14	0	0%	0.711	0.376	-	-	1.422
VOCs	Chloromethane	74-87-3	14	0	0%	0.521	0.257	-	-	1.041
VOCs	Cyclohexane	110-82-7	14	0	0%	0.243	0.104	-	-	0.485
VOCs	Dibromochloromethane	124-48-1	14	0	0%	0.289	0.142	-	-	0.577
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	14	0	0%	0.540	0.219	-	-	1.079
VOCs	1,2-Dibromoethane	106-93-4	14	0	0%	0.340	0.169	-	-	0.680
VOCs	1,2-Dichlorobenzene	95-50-1	14	0	0%	0.338	0.164	-	-	0.675
VOCs	1,3-Dichlorobenzene	541-73-1	14	0	0%	0.250	0.119	-	-	0.500
VOCs	1,4-Dichlorobenzene	106-46-7	14	0	0%	0.229	0.111	-	-	0.459
VOCs	Dichlorodifluoromethane	75-71-8	14	0	0%	0.231	0.106	-	-	0.463
VOCs	1,1-Dichloroethane	75-34-3	14	0	0%	0.255	0.119	-	-	0.510
VOCs	1,2-Dichloroethane	107-06-2	14	0	0%	0.327	0.155	-	-	0.654
VOCs	1,1-Dichloroethene	75-35-4	14	0	0%	0.359	0.171	-	-	0.718
VOCs	cis-1,2-Dichloroethene	156-59-2	14	0	0%	0.279	0.131	-	-	0.558
VOCs	trans-1,2-Dichloroethene	156-60-5	14	0	0%	0.222	0.105	-	-	0.444
VOCs	1,2-Dichloropropane	78-87-5	14	0	0%	0.230	0.099	-	-	0.460
VOCs	cis-1,3-Dichloropropene	10061-01-5	14	0	0%	0.242	0.115	-	-	0.484
VOCs	trans-1,3-Dichloropropene	10061-02-6	14	0	0%	0.292	0.146	-	-	0.583
VOCs	Ethylbenzene	100-41-4	14	0	0%	0.213	0.104	-	-	0.425
VOCs	2-Hexanone	591-78-6	14	0	0%	2.282	1.128	-	-	4.564
VOCs	Isopropylbenzene	98-82-8	14	0	0%	0.237	0.114	-	-	0.475
VOCs	Methyl acetate	79-20-9	14	0	0%	0.454	0.192	-	-	0.907
VOCs	Methyl tert-butyl ether	1634-04-4	14	0	0%	0.202	0.096	-	-	0.403
VOCs	Methylene chloride	75-09-2	14	0	0%	0.715	0.369	-	-	1.429
VOCs	Methylcyclohexane	108-87-2	14	0	0%	0.288	0.142	-	-	0.577
VOCs	4-Methyl-2-pentanone	108-10-1	14	0	0%	0.604	0.192	-	-	1.207

Table A-5. Pore Water Summary – Arkansas River/Runyon State Wildlife Area – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
VOCs	Styrene	100-42-5	14	0	0%	0.247	0.125	-	-	0.495
VOCs	Tetrachloroethene	127-18-4	14	0	0%	0.216	0.108	-	-	0.432
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	14	0	0%	0.403	0.172	-	-	0.806
VOCs	Toluene	108-88-3	14	0	0%	0.514	0.270	-	-	1.029
VOCs	1,1,1-Trichloroethane	71-55-6	14	0	0%	0.238	0.113	-	-	0.477
VOCs	1,1,2-Trichloroethane	79-00-5	14	0	0%	0.313	0.144	-	-	0.625
VOCs	1,2,3-Trichlorobenzene	87-61-6	14	0	0%	0.345	0.168	-	-	0.691
VOCs	1,2,4-Trichlorobenzene	120-82-1	14	0	0%	0.477	0.244	-	-	0.954
VOCs	Trichloroethene	79-01-6	14	0	0%	0.319	0.161	-	-	0.638
VOCs	Trichlorofluoromethane	75-69-4	14	0	0%	0.261	0.128	-	-	0.522
VOCs	1,2,3-Trichloropropane	96-18-4	11	0	0%	0.600	0.000	-	-	1.200
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	14	0	0%	0.396	0.197	-	-	0.792
VOCs	1,2,4-Trimethylbenzene	95-63-6	11	0	0%	0.325	0.000	-	-	0.650
VOCs	1,3,5-Trimethylbenzene	108-67-8	11	0	0%	0.275	0.000	-	-	0.550
VOCs	Vinyl chloride	75-01-4	14	0	0%	0.333	0.154	-	-	0.665
VOCs	m, p-Xylene	179601-23-1	14	0	0%	0.221	0.108	-	-	0.441
VOCs	o-Xylene	95-47-6	14	0	0%	0.248	0.122	-	-	0.497

Notes:

SVOCs: Semi volatile organic compounds

VOCs: Volatile organic compounds

MDL: Method detection limit

µg/L: Microgram per liter

Table A-6. Pore Water Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
Metals	Aluminum	7429-90-5	9	2	22%	137.444	145.850	PW004-20190305-01	406.000	125.111
Metals	Antimony	7440-36-0	9	0	0%	2.170	0.000	-	-	4.340
Metals	Arsenic	7440-38-2	9	4	44%	5.924	7.718	PW014-20190307-01	24.700	3.060
Metals	Barium	7440-39-3	9	9	100%	41.867	19.288	PW011-20190312-01	77.500	5.100
Metals	Beryllium	7440-41-7	9	0	0%	2.295	0.000	-	-	4.590
Metals	Cadmium	7440-43-9	9	0	0%	0.895	0.000	-	-	1.790
Metals	Chromium	7440-47-3	9	0	0%	3.119	0.213	-	-	6.238
Metals	Cobalt	7440-48-4	9	0	0%	1.247	0.085	-	-	2.493
Metals	Copper	7440-50-8	9	3	33%	15.276	26.301	PW005-20190315-01	85.000	9.973
Metals	Iron	7439-89-6	9	6	67%	3,662.889	9,663.004	PW014-20190307-01	29,400.000	99.733
Metals	Lead	7439-92-1	9	6	67%	15.799	24.960	PW005-20190315-01	74.900	1.280
Metals	Manganese	7439-96-5	9	7	78%	566.062	1,101.892	PW014-20190307-01	3,390.000	5.241
Metals	Mercury	7439-97-6	9	9	100%	0.002	0.001	PW005-20190315-01	0.004	0.000
Metals	Nickel	7440-02-0	9	1	11%	6.500	1.697	PW001-20190305-01	10.900	11.933
Metals	Selenium	7782-49-2	9	7	78%	40.268	36.452	PW006-20190318-01	89.100	4.590
Metals	Silver	7440-22-4	9	0	0%	0.895	0.000	-	-	1.790
Metals	Thallium	7440-28-0	9	0	0%	1.660	0.000	-	-	3.320
Metals	Vanadium	7440-62-2	9	2	22%	4.580	3.538	PW004-20190305-01	13.600	6.120
Metals	Zinc	7440-66-6	9	3	33%	148.689	231.377	PW005-20190315-01	634.000	51.000
Metals, Diss	Aluminum	7429-90-5	9	0	0%	64.000	0.000	-	-	128.000
Metals, Diss	Antimony	7440-36-0	9	1	11%	4.340	6.510	PW004-20190305-01	21.700	4.340
Metals, Diss	Arsenic	7440-38-2	9	3	33%	5.076	6.997	PW014-20190307-01	22.400	3.060
Metals, Diss	Barium	7440-39-3	9	9	100%	38.089	18.871	PW011-20190312-01	77.800	5.100
Metals, Diss	Beryllium	7440-41-7	9	0	0%	2.295	0.000	-	-	4.590
Metals, Diss	Cadmium	7440-43-9	9	0	0%	0.895	0.000	-	-	1.790
Metals, Diss	Chromium	7440-47-3	9	0	0%	3.048	0.282	-	-	6.096
Metals, Diss	Cobalt	7440-48-4	9	1	11%	1.453	0.635	PW004-20190305-01	3.130	2.437
Metals, Diss	Copper	7440-50-8	9	2	22%	13.951	25.124	PW005-20190315-01	80.700	9.747
Metals, Diss	Iron	7439-89-6	9	3	33%	3,307.644	9,450.432	PW014-20190307-01	28,500.000	97.467

Table A-6. Pore Water Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
Metals, Diss	Lead	7439-92-1	9	2	22%	9.653	22.081	PW005-20190315-01	67.100	1.280
Metals, Diss	Manganese	7439-96-5	9	7	78%	546.818	1,097.020	PW014-20190307-01	3,340.000	5.241
Metals, Diss	Mercury	7439-97-6	9	9	100%	0.001	0.001	PW005-20190315-01	0.002	0.000
Metals, Diss	Nickel	7440-02-0	9	0	0%	5.833	0.529	-	-	11.667
Metals, Diss	Selenium	7782-49-2	9	7	78%	40.660	37.780	PW006-20190318-01	93.000	4.590
Metals, Diss	Silver	7440-22-4	9	0	0%	0.895	0.000	-	-	1.790
Metals, Diss	Thallium	7440-28-0	9	0	0%	1.660	0.000	-	-	3.320
Metals, Diss	Vanadium	7440-62-2	9	0	0%	3.060	0.000	-	-	6.120
Metals, Diss	Zinc	7440-66-6	9	2	22%	134.167	227.892	PW005-20190315-01	662.000	51.000
SVOCs	Acenaphthene	83-32-9	9	0	0%	0.004	0.000	-	-	0.008
SVOCs	Acenaphthylene	208-96-8	9	0	0%	0.005	0.000	-	-	0.010
SVOCs	Acetophenone	98-86-2	9	0	0%	0.321	0.005	-	-	0.641
SVOCs	Anthracene	120-12-7	9	0	0%	0.004	0.000	-	-	0.008
SVOCs	Atrazine	1912-24-9	9	0	0%	0.368	0.008	-	-	0.737
SVOCs	Benzaldehyde	100-52-7	9	0	0%	0.323	0.008	-	-	0.647
SVOCs	Benzo(a)anthracene	56-55-3	9	0	0%	0.009	0.000	-	-	0.018
SVOCs	Benzo(a)pyrene	50-32-8	9	0	0%	0.007	0.000	-	-	0.014
SVOCs	Benzo(b)fluoranthene	205-99-2	9	0	0%	0.007	0.000	-	-	0.015
SVOCs	Benzo(g,h,i)perylene	191-24-2	9	0	0%	0.011	0.000	-	-	0.023
SVOCs	Benzo(k)fluoranthene	207-08-9	9	0	0%	0.008	0.000	-	-	0.015
SVOCs	1,1'-Biphenyl	92-52-4	9	0	0%	0.291	0.005	-	-	0.581
SVOCs	4-Bromophenyl-phenylether	101-55-3	9	0	0%	0.316	0.005	-	-	0.631
SVOCs	Butylbenzylphthalate	85-68-7	9	0	0%	0.348	0.008	-	-	0.697
SVOCs	Caprolactam	105-60-2	9	0	0%	0.778	0.026	-	-	1.556
SVOCs	Carbazole	86-74-8	9	0	0%	0.256	0.005	-	-	0.511
SVOCs	4-Chloroaniline	106-47-8	9	0	0%	0.281	0.005	-	-	0.561
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	9	0	0%	0.256	0.005	-	-	0.511
SVOCs	Bis(2-Chloroethyl) ether	111-44-4	9	0	0%	0.273	0.008	-	-	0.547
SVOCs	4-Chloro-3-methylphenol	59-50-7	9	0	0%	0.281	0.005	-	-	0.561

Table A-6. Pore Water Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
SVOCs	2-Chloronaphthalene	91-58-7	9	0	0%	0.276	0.005	-	-	0.551
SVOCs	2-Chlorophenol	95-57-8	9	0	0%	0.251	0.005	-	-	0.501
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	9	0	0%	0.336	0.005	-	-	0.671
SVOCs	Chrysene	218-01-9	9	0	0%	0.008	0.000	-	-	0.015
SVOCs	Dibenzo(a,h)anthracene	53-70-3	9	0	0%	0.015	0.000	-	-	0.030
SVOCs	Dibenzofuran	132-64-9	9	0	0%	0.276	0.005	-	-	0.551
SVOCs	3,3'-Dichlorobenzidine	91-94-1	9	0	0%	0.431	0.011	-	-	0.862
SVOCs	2,4-Dichlorophenol	120-83-2	9	0	0%	0.326	0.005	-	-	0.651
SVOCs	Diethylphthalate	84-66-2	9	0	0%	0.331	0.005	-	-	0.661
SVOCs	2,4-Dimethylphenol	105-67-9	9	0	0%	0.296	0.005	-	-	0.591
SVOCs	Dimethylphthalate	131-11-3	9	0	0%	0.378	0.008	-	-	0.757
SVOCs	Di-n-butylphthalate	84-74-2	9	0	0%	0.313	0.008	-	-	0.627
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	9	0	0%	0.328	0.008	-	-	0.657
SVOCs	2,4-Dinitrophenol	51-28-5	9	0	0%	0.246	0.005	-	-	0.491
SVOCs	2,4-Dinitrotoluene	121-14-2	9	0	0%	0.356	0.005	-	-	0.711
SVOCs	2,6-Dinitrotoluene	606-20-2	9	0	0%	0.286	0.005	-	-	0.571
SVOCs	Di-n-octylphthalate	117-84-0	9	0	0%	0.431	0.011	-	-	0.862
SVOCs	1,4-Dioxane	123-91-1	9	0	0%	0.241	0.005	-	-	0.481
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	9	0	0%	0.338	0.008	-	-	0.677
SVOCs	Fluoranthene	206-44-0	9	0	0%	0.006	0.000	-	-	0.013
SVOCs	Fluorene	86-73-7	9	0	0%	0.005	0.000	-	-	0.010
SVOCs	Hexachlorobenzene	118-74-1	9	0	0%	0.266	0.005	-	-	0.531
SVOCs	Hexachlorobutadiene	87-68-3	9	0	0%	0.261	0.005	-	-	0.521
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	9	0	0%	1.478	0.026	-	-	2.956
SVOCs	Hexachloroethane	67-72-1	9	0	0%	0.328	0.008	-	-	0.657
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	9	0	0%	0.012	0.000	-	-	0.025
SVOCs	Isophorone	78-59-1	9	0	0%	0.281	0.005	-	-	0.561
SVOCs	1-Methylnaphthalene	90-12-0	0	0	-	-	-	-	-	-
SVOCs	2-Methylnaphthalene	91-57-6	9	0	0%	0.008	0.000	-	-	0.016

Table A-6. Pore Water Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
SVOCs	2-Methylphenol	95-48-7	9	0	0%	0.276	0.005	-	-	0.551
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	6	0	0%	0.305	0.008	-	-	0.610
SVOCs	4-Methylphenol	106-44-5	3	0	0%	0.315	0.000	-	-	0.630
SVOCs	Naphthalene	91-20-3	9	0	0%	0.015	0.000	-	-	0.031
SVOCs	2-Nitroaniline	88-74-4	9	0	0%	0.256	0.005	-	-	0.511
SVOCs	3-Nitroaniline	99-09-2	9	0	0%	0.333	0.008	-	-	0.667
SVOCs	4-Nitroaniline	100-01-6	9	0	0%	0.318	0.008	-	-	0.637
SVOCs	Nitrobenzene	98-95-3	9	0	0%	0.256	0.005	-	-	0.511
SVOCs	2-Nitrophenol	88-75-5	9	0	0%	0.328	0.008	-	-	0.657
SVOCs	4-Nitrophenol	100-02-7	9	0	0%	0.408	0.008	-	-	0.817
SVOCs	N-Nitroso-di-n propylamine	621-64-7	9	0	0%	0.343	0.008	-	-	0.687
SVOCs	N-Nitrosodiphenylamine	86-30-6	9	0	0%	0.291	0.005	-	-	0.581
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	9	0	0%	0.296	0.005	-	-	0.591
SVOCs	Pentachlorophenol	87-86-5	9	1	11%	0.149	0.252	PW002-20190304-01	0.820	0.130
SVOCs	Phenanthrene	85-01-8	9	0	0%	0.008	0.000	-	-	0.016
SVOCs	Phenol	108-95-2	9	1	11%	1.548	3.920	PW001-20190305-01	12.000	0.481
SVOCs	Pyrene	129-00-0	9	0	0%	0.008	0.000	-	-	0.016
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	9	0	0%	0.261	0.005	-	-	0.521
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	9	0	0%	0.388	0.008	-	-	0.777
SVOCs	2,4,5-Trichlorophenol	95-95-4	9	0	0%	0.246	0.005	-	-	0.491
SVOCs	2,4,6-Trichlorophenol	88-06-2	9	0	0%	0.286	0.005	-	-	0.571
VOCs	Acetone	67-64-1	9	3	33%	5.489	11.618	PW001-20190305-01	36.000	1.400
VOCs	Benzene	71-43-2	9	0	0%	0.026	0.000	-	-	0.051
VOCs	Bromochloromethane	74-97-5	9	0	0%	0.050	0.000	-	-	0.100
VOCs	Bromodichloromethane	75-27-4	9	0	0%	0.034	0.000	-	-	0.067
VOCs	Bromoform	75-25-2	9	0	0%	0.044	0.000	-	-	0.088
VOCs	Bromomethane	74-83-9	9	0	0%	0.050	0.000	-	-	0.100
VOCs	2-Butanone	78-93-3	9	0	0%	0.800	0.000	-	-	1.600
VOCs	Carbon disulfide	75-15-0	9	1	11%	0.054	0.049	PW001-20190305-01	0.185	0.076

Table A-6. Pore Water Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
VOCs	Carbon tetrachloride	56-23-5	9	0	0%	0.018	0.000	-	-	0.035
VOCs	Chlorobenzene	108-90-7	9	0	0%	0.015	0.000	-	-	0.030
VOCs	Chloroethane	75-00-3	9	0	0%	0.050	0.000	-	-	0.100
VOCs	Chloroform	67-66-3	9	1	11%	0.184	0.497	PW001-20190305-01	1.509	0.036
VOCs	Chloromethane	74-87-3	9	0	0%	0.046	0.000	-	-	0.092
VOCs	Cyclohexane	110-82-7	9	0	0%	0.050	0.000	-	-	0.100
VOCs	Dibromochloromethane	124-48-1	9	0	0%	0.027	0.000	-	-	0.053
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	9	0	0%	0.135	0.000	-	-	0.270
VOCs	1,2-Dibromoethane	106-93-4	9	0	0%	0.029	0.000	-	-	0.057
VOCs	1,2-Dichlorobenzene	95-50-1	9	0	0%	0.036	0.000	-	-	0.072
VOCs	1,3-Dichlorobenzene	541-73-1	9	1	11%	0.048	0.053	PW001-20190305-01	0.190	0.060
VOCs	1,4-Dichlorobenzene	106-46-7	9	0	0%	0.025	0.000	-	-	0.050
VOCs	Dichlorodifluoromethane	75-71-8	9	0	0%	0.035	0.000	-	-	0.070
VOCs	1,1-Dichloroethane	75-34-3	9	0	0%	0.035	0.000	-	-	0.070
VOCs	1,2-Dichloroethane	107-06-2	9	0	0%	0.042	0.000	-	-	0.083
VOCs	1,1-Dichloroethene	75-35-4	9	0	0%	0.043	0.000	-	-	0.085
VOCs	cis-1,2-Dichloroethene	156-59-2	9	0	0%	0.038	0.000	-	-	0.075
VOCs	trans-1,2-Dichloroethene	156-60-5	9	0	0%	0.028	0.000	-	-	0.056
VOCs	1,2-Dichloropropane	78-87-5	9	0	0%	0.047	0.000	-	-	0.093
VOCs	cis-1,3-Dichloropropene	10061-01-5	9	0	0%	0.030	0.000	-	-	0.060
VOCs	trans-1,3-Dichloropropene	10061-02-6	9	0	0%	0.022	0.000	-	-	0.044
VOCs	Ethylbenzene	100-41-4	9	0	0%	0.021	0.000	-	-	0.041
VOCs	2-Hexanone	591-78-6	9	0	0%	0.200	0.000	-	-	0.400
VOCs	Isopropylbenzene	98-82-8	9	0	0%	0.027	0.000	-	-	0.053
VOCs	Methyl acetate	79-20-9	9	0	0%	0.100	0.000	-	-	0.200
VOCs	Methyl tert-butyl ether	1634-04-4	9	0	0%	0.024	0.000	-	-	0.048
VOCs	Methylene chloride	75-09-2	9	0	0%	0.035	0.000	-	-	0.069
VOCs	Methylcyclohexane	108-87-2	9	0	0%	0.026	0.000	-	-	0.051
VOCs	4-Methyl-2-pentanone	108-10-1	9	0	0%	0.250	0.000	-	-	0.500

Table A-6. Pore Water Summary – Onsite Ravines – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (µg/L)	Standard Deviation (µg/L)	Sample_No of Max	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)
VOCs	Styrene	100-42-5	9	0	0%	0.018	0.000	-	-	0.035
VOCs	Tetrachloroethene	127-18-4	9	0	0%	0.017	0.000	-	-	0.034
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	9	0	0%	0.085	0.000	-	-	0.170
VOCs	Toluene	108-88-3	9	2	22%	0.077	0.170	PW001-20190305-01	0.530	0.034
VOCs	1,1,1-Trichloroethane	71-55-6	9	0	0%	0.031	0.000	-	-	0.061
VOCs	1,1,2-Trichloroethane	79-00-5	9	0	0%	0.047	0.000	-	-	0.094
VOCs	1,2,3-Trichlorobenzene	87-61-6	9	0	0%	0.036	0.000	-	-	0.071
VOCs	1,2,4-Trichlorobenzene	120-82-1	9	0	0%	0.026	0.000	-	-	0.052
VOCs	Trichloroethene	79-01-6	9	1	11%	0.029	0.021	PW001-20190305-01	0.086	0.043
VOCs	Trichlorofluoromethane	75-69-4	9	0	0%	0.026	0.000	-	-	0.051
VOCs	1,2,3-Trichloropropane	96-18-4	0	0	-	-	-	-	-	-
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	9	0	0%	0.033	0.000	-	-	0.065
VOCs	1,2,4-Trimethylbenzene	95-63-6	0	0	-	-	-	-	-	-
VOCs	1,3,5-Trimethylbenzene	108-67-8	0	0	-	-	-	-	-	-
VOCs	Vinyl chloride	75-01-4	9	0	0%	0.049	0.000	-	-	0.097
VOCs	m, p-Xylene	179601-23-1	9	0	0%	0.022	0.000	-	-	0.043
VOCs	o-Xylene	95-47-6	9	0	0%	0.023	0.000	-	-	0.045
Inorganic	Chloride	16887-00-6	9	9	100%	119,088.889	90,638.229	PW014-20190307-01	296,000.000	7,777.778
Inorganic	Fluoride	16984-48-8	9	9	100%	2,783.333	1,845.264	PW001-20190305-01	7,250.000	777.778
Inorganic	Sulfate (as SO4)	148-08-798	9	9	100%	1,208,333.333	589,941.734	PW010-20190311-01	1,780,000.000	19,444.444

Notes:

SVOCs: Semi volatile organic compounds

VOCs: Volatile organic compounds

MDL: Method detection limit

µg/L: Microgram per liter

Table A-7. Surficial Soil Summary – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
Metals	Aluminum	7429-90-5	3	3	100%	6,900.000	-	S0124-DU-0612-31	6,900.000	5.400
Metals	Antimony	7440-36-0	576	538	93%	2.759	3.356	S0016-DU-1824-31	19.500	0.067
Metals	Arsenic	7440-38-2	576	576	100%	67.480	181.316	S0030-DU-1824-31	1,180.000	0.064
Metals	Barium	7440-39-3	576	576	100%	234.464	203.567	S0017-DU-0612-31	1,540.000	0.301
Metals	Beryllium	7440-41-7	576	527	91%	0.686	0.401	S0019-DU-1824-31	3.300	0.045
Metals	Cadmium	7440-43-9	576	576	100%	6.078	8.394	S0023-DU-1218-31	69.800	0.061
Metals	Chromium	7440-47-3	576	576	100%	24.529	43.855	S0100-DU-0001-31-ICP	390.000	0.093
Metals	Chromium, Hexavalent	18540-29-9	138	109	79%	0.363	0.732	S0001-DU-0001-31	3.270	0.012
Metals	Cobalt	7440-48-4	576	576	100%	6.677	1.726	S0053-DU-0001-31	15.000	0.036
Metals	Copper	7440-50-8	576	576	100%	164.576	315.606	S0013-DU-0106-31-ICP	2,130.000	0.190
Metals	Iron	7439-89-6	3	3	100%	18,000.000	-	S0124-DU-1824-31	18,000.000	1.400
Metals	Lead	7439-92-1	576	576	100%	783.614	1,474.818	S0013-DU-0106-31-ICP	9,290.000	0.314
Metals	Manganese	7439-96-5	576	575	100%	1,051.622	1,222.417	S0012-DU-0612-31	8,630.000	0.401
Metals	Mercury	7439-97-6	173	164	95%	1.223	2.452	S0035-DU-1824-31	11.500	0.020
Metals	Nickel	7440-02-0	576	575	100%	126.065	484.781	S0022-DU-1218-31	5,300.000	0.069
Metals	Selenium	7782-49-2	576	523	91%	2.821	2.278	S0098-DU-1218-31	11.000	0.373
Metals	Silver	7440-22-4	576	551	96%	3.864	7.718	S0025-DU-0612-31	36.700	0.038
Metals	Thallium	7440-28-0	576	519	90%	0.395	0.273	S0016-DU-1824-31	1.600	0.047
Metals	Vanadium	7440-62-2	576	575	100%	31.726	8.700	S0082-DU-1218-31	55.000	0.175
Metals	Zinc	7440-66-6	576	576	100%	1,287.565	2,078.202	S0013-DU-0106-31-ICP	11,900.000	1.290
SVOCs	Low Molecular Weight PAHs	PAH_Low	175	175	100%	0.390	0.542	S0023-DU-0612-31	2.479	0.008
SVOCs	Acenaphthene	83-32-9	175	158	90%	0.028	0.052	S0023-DU-0612-31	0.260	0.001
SVOCs	Acenaphthylene	208-96-8	175	171	98%	0.023	0.029	S0131-DU-0612-31	0.120	0.001
SVOCs	Anthracene	120-12-7	175	170	97%	0.048	0.068	S0023-DU-0612-31	0.300	0.001
SVOCs	Fluorene	86-73-7	175	133	76%	0.025	0.046	S0023-DU-0612-31	0.200	0.001
SVOCs	1-Methylnaphthalene	90-12-0	37	25	68%	0.004	0.003	S0026-DU-0001-25-32	0.011	0.002
SVOCs	2-Methylnaphthalene	91-57-6	175	171	98%	0.032	0.067	S0034-DU-0106-31	0.410	0.001
SVOCs	Naphthalene	91-20-3	175	162	93%	0.023	0.036	S0023-DU-0612-31	0.160	0.001
SVOCs	Phenanthrene	85-01-8	175	175	100%	0.220	0.323	S0023-DU-0612-31	1.400	0.002
SVOCs	High Molecular Weight PAHs	PAH_High	175	175	100%	2.131	2.446	S0032-DU-1218-31	12.014	0.024
SVOCs	Benzo(a)anthracene	56-55-3	175	175	100%	0.219	0.289	S0032-DU-1218-31	1.500	0.002
SVOCs	Benzo(a)pyrene	50-32-8	175	175	100%	0.214	0.239	S0032-DU-1218-31	1.200	0.002
SVOCs	Benzo(b)fluoranthene	205-99-2	175	175	100%	0.346	0.381	S0032-DU-1218-31	2.000	0.003
SVOCs	Benzo(g,h,i)perylene	191-24-2	175	175	100%	0.130	0.126	S0025-DU-0612-31	0.430	0.003
SVOCs	Benzo(k)fluoranthene	207-08-9	175	175	100%	0.126	0.136	S0032-DU-1218-31	0.640	0.002
SVOCs	Chrysene	218-01-9	175	175	100%	0.264	0.334	S0032-DU-1218-31	1.800	0.002

Table A-7. Surficial Soil Summary – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
SVOCs	Dibenzo(a,h)anthracene	53-70-3	175	36	21%	0.006	0.008	S0026-DU-0001-25-32	0.034	0.002
SVOCs	Fluoranthene	206-44-0	175	175	100%	0.362	0.460	S0032-DU-1218-31	2.300	0.002
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	175	175	100%	0.124	0.115	S0032-DU-1218-31	0.380	0.003
SVOCs	Pyrene	129-00-0	175	175	100%	0.354	0.426	S0032-DU-1218-31	1.800	0.002
SVOCs	Acetophenone	98-86-2	175	1	1%	0.021	0.016	S0674-DU-0001-31-V	0.092	0.028
SVOCs	Atrazine	1912-24-9	175	0	0%	0.026	0.016	-	-	0.035
SVOCs	Benzaldehyde	100-52-7	175	3	2%	0.023	0.015	S0026-DU-1218-32	0.021	0.031
SVOCs	1,1'-Biphenyl	92-52-4	175	4	2%	0.037	0.070	S0034-DU-0106-31	0.450	0.038
SVOCs	4-Bromophenyl-phenylether	101-55-3	175	0	0%	0.027	0.017	-	-	0.037
SVOCs	Butylbenzylphthalate	85-68-7	175	8	5%	0.027	0.014	S0031-DU-0001-31	0.039	0.034
SVOCs	Caprolactam	105-60-2	175	0	0%	0.028	0.017	-	-	0.038
SVOCs	Carbazole	86-74-8	175	9	5%	0.033	0.032	S0026-DU-1218-32	0.142	0.034
SVOCs	4-Chloroaniline	106-47-8	175	0	0%	0.023	0.013	-	-	0.032
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	175	0	0%	0.023	0.014	-	-	0.033
SVOCs	Bis(2-Chloroethyl)ether	111-44-4	175	0	0%	0.023	0.013	-	-	0.031
SVOCs	4-Chloro-3-methylphenol	59-50-7	175	0	0%	0.023	0.014	-	-	0.033
SVOCs	2-Chloronaphthalene	91-58-7	175	0	0%	0.026	0.015	-	-	0.037
SVOCs	2-Chlorophenol	95-57-8	175	0	0%	0.023	0.014	-	-	0.033
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	175	0	0%	0.024	0.014	-	-	0.033
SVOCs	Dibenzofuran	132-64-9	175	11	6%	0.031	0.026	S0023-DU-0612-31	0.140	0.037
SVOCs	3,3'-Dichlorobenzidine	91-94-1	175	0	0%	0.021	0.013	-	-	0.032
SVOCs	2,4-Dichlorophenol	120-83-2	175	0	0%	0.024	0.014	-	-	0.035
SVOCs	Diethylphthalate	84-66-2	175	0	0%	0.023	0.014	-	-	0.032
SVOCs	2,4-Dimethylphenol	105-67-9	175	0	0%	0.024	0.014	-	-	0.037
SVOCs	Dimethylphthalate	131-11-3	175	0	0%	0.026	0.016	-	-	0.036
SVOCs	Di-n-butylphthalate	84-74-2	175	2	1%	0.026	0.016	S0036-DU-0106-31	0.036	0.033
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	175	0	0%	0.029	0.019	-	-	0.044
SVOCs	2,4-Dinitrophenol	51-28-5	175	0	0%	0.023	0.014	-	-	0.032
SVOCs	2,4-Dinitrotoluene	121-14-2	175	0	0%	0.027	0.016	-	-	0.037
SVOCs	2,6-Dinitrotoluene	606-20-2	175	0	0%	0.026	0.016	-	-	0.034
SVOCs	Di-n-octylphthalate	117-84-0	175	0	0%	0.023	0.014	-	-	0.033
SVOCs	1,4-Dioxane	123-91-1	175	0	0%	0.010	0.007	-	-	0.015
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	175	63	36%	0.101	0.197	S0015-DU-0001-31	0.990	0.033
SVOCs	Hexachlorobenzene	118-74-1	175	0	0%	0.027	0.017	-	-	0.037
SVOCs	Hexachlorobutadiene	87-68-3	175	0	0%	0.024	0.014	-	-	0.035
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	175	0	0%	0.032	0.024	-	-	0.053

Table A-7. Surficial Soil Summary – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
SVOCs	Hexachloroethane	67-72-1	175	0	0%	0.020	0.012	-	-	0.029
SVOCs	Isophorone	78-59-1	175	0	0%	0.021	0.012	-	-	0.031
SVOCs	2-Methylphenol	95-48-7	175	0	0%	0.022	0.014	-	-	0.032
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	138	0	0%	0.015	0.013	-	-	0.027
SVOCs	4-Methylphenol	106-44-5	37	0	0%	0.025	0.003	-	-	0.048
SVOCs	2-Nitroaniline	88-74-4	175	0	0%	0.028	0.017	-	-	0.039
SVOCs	3-Nitroaniline	99-09-2	175	0	0%	0.020	0.012	-	-	0.029
SVOCs	4-Nitroaniline	100-01-6	175	0	0%	0.025	0.016	-	-	0.034
SVOCs	Nitrobenzene	98-95-3	175	0	0%	0.023	0.014	-	-	0.032
SVOCs	2-Nitrophenol	88-75-5	175	0	0%	0.026	0.016	-	-	0.037
SVOCs	4-Nitrophenol	100-02-7	175	0	0%	0.027	0.016	-	-	0.040
SVOCs	N-Nitroso-di-n propylamine	621-64-7	175	0	0%	0.024	0.015	-	-	0.032
SVOCs	N-Nitrosodiphenylamine	86-30-6	175	3	2%	0.026	0.015	S0018-DU-0612-31	0.021	0.036
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	175	0	0%	0.021	0.013	-	-	0.031
SVOCs	Pentachlorophenol	87-86-5	175	45	26%	0.006	0.006	S0001-DU-1824-31	0.032	0.005
SVOCs	Phenol	108-95-2	175	0	0%	0.023	0.014	-	-	0.034
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	175	0	0%	0.026	0.016	-	-	0.037
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	175	0	0%	0.026	0.016	-	-	0.036
SVOCs	2,4,5-Trichlorophenol	95-95-4	175	0	0%	0.025	0.015	-	-	0.035
SVOCs	2,4,6-Trichlorophenol	88-06-2	175	0	0%	0.029	0.017	-	-	0.040
VOCs	Acetone	67-64-1	176	67	38%	0.066	0.206	S0131-DU-1824-31-V	0.170	0.047
VOCs	Benzene	71-43-2	176	0	0%	0.009	0.049	-	-	0.007
VOCs	Bromochloromethane	74-97-5	176	0	0%	0.006	0.033	-	-	0.006
VOCs	Bromodichloromethane	75-27-4	176	0	0%	0.005	0.028	-	-	0.005
VOCs	Bromoform	75-25-2	176	0	0%	0.004	0.021	-	-	0.005
VOCs	Bromomethane	74-83-9	176	0	0%	0.011	0.055	-	-	0.013
VOCs	2-Butanone	78-93-3	176	11	6%	0.028	0.135	S0128-DU-0001-31-V	0.033	0.030
VOCs	Carbon disulfide	75-15-0	176	4	2%	0.006	0.033	S0005-DU-0612-31-V	0.004	0.006
VOCs	Carbon tetrachloride	56-23-5	176	0	0%	0.006	0.028	-	-	0.007
VOCs	Chlorobenzene	108-90-7	176	0	0%	0.005	0.022	-	-	0.005
VOCs	Chloroethane	75-00-3	176	0	0%	0.006	0.027	-	-	0.009
VOCs	Chloroform	67-66-3	176	1	1%	0.008	0.042	S0008-DU-1218-31-V	0.006	0.006
VOCs	Chloromethane	74-87-3	176	0	0%	0.006	0.025	-	-	0.007
VOCs	Cyclohexane	110-82-7	176	0	0%	0.008	0.043	-	-	0.010
VOCs	Dibromochloromethane	124-48-1	176	0	0%	0.006	0.033	-	-	0.006
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	176	0	0%	0.007	0.038	-	-	0.008

Table A-7. Surficial Soil Summary – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
VOCs	1,2-Dibromoethane	106-93-4	176	0	0%	0.005	0.027	-	-	0.005
VOCs	1,2-Dichlorobenzene	95-50-1	176	0	0%	0.006	0.032	-	-	0.006
VOCs	1,3-Dichlorobenzene	541-73-1	176	0	0%	0.006	0.033	-	-	0.006
VOCs	1,4-Dichlorobenzene	106-46-7	176	0	0%	0.005	0.025	-	-	0.005
VOCs	Dichlorodifluoromethane	75-71-8	176	0	0%	0.012	0.059	-	-	0.010
VOCs	1,1-Dichloroethane	75-34-3	176	0	0%	0.007	0.037	-	-	0.006
VOCs	1,2-Dichloroethane	107-06-2	176	0	0%	0.005	0.027	-	-	0.005
VOCs	1,1-Dichloroethene	75-35-4	176	0	0%	0.009	0.052	-	-	0.008
VOCs	cis-1,2-Dichloroethene	156-59-2	176	1	1%	0.008	0.038	S0002-DU-1218-31-V	0.031	0.006
VOCs	trans-1,2-Dichloroethene	156-60-5	176	0	0%	0.006	0.032	-	-	0.006
VOCs	1,2-Dichloropropane	78-87-5	176	0	0%	0.006	0.030	-	-	0.006
VOCs	cis-1,3-Dichloropropene	10061-01-5	176	0	0%	0.006	0.032	-	-	0.006
VOCs	trans-1,3-Dichloropropene	10061-02-6	176	0	0%	0.009	0.046	-	-	0.009
VOCs	Ethylbenzene	100-41-4	176	2	1%	0.020	0.120	S0034-DU-0106-31-V	0.750	0.006
VOCs	2-Hexanone	591-78-6	176	16	9%	0.027	0.144	S0128-DU-0001-31-V	0.019	0.030
VOCs	Isopropylbenzene	98-82-8	176	2	1%	0.022	0.128	S0034-DU-0106-31-V	0.800	0.005
VOCs	Methyl acetate	79-20-9	176	10	6%	0.007	0.032	S0128-DU-0001-31-V	0.004	0.007
VOCs	Methyl tert-butyl ether	1634-04-4	176	0	0%	0.006	0.029	-	-	0.006
VOCs	Methylene chloride	75-09-2	176	39	22%	0.009	0.028	S0004-DU-0001-25-31-V	0.014	0.006
VOCs	Methylcyclohexane	108-87-2	176	2	1%	0.021	0.123	S0034-DU-0106-31-V	0.770	0.011
VOCs	4-Methyl-2-pentanone	108-10-1	176	0	0%	0.008	0.033	-	-	0.010
VOCs	Styrene	100-42-5	176	0	0%	0.006	0.029	-	-	0.005
VOCs	Tetrachloroethene	127-18-4	176	0	0%	0.005	0.023	-	-	0.006
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	176	0	0%	0.007	0.033	-	-	0.006
VOCs	Toluene	108-88-3	176	9	5%	0.012	0.067	S0034-DU-0106-31-V	0.420	0.006
VOCs	1,1,1-Trichloroethane	71-55-6	176	0	0%	0.006	0.028	-	-	0.005
VOCs	1,1,2-Trichloroethane	79-00-5	176	0	0%	0.005	0.027	-	-	0.005
VOCs	1,2,3-Trichlorobenzene	87-61-6	176	0	0%	0.006	0.031	-	-	0.006
VOCs	1,2,4-Trichlorobenzene	120-82-1	176	0	0%	0.007	0.034	-	-	0.006
VOCs	Trichloroethene	79-01-6	176	0	0%	0.005	0.025	-	-	0.005
VOCs	Trichlorofluoromethane	75-69-4	176	0	0%	0.008	0.043	-	-	0.008
VOCs	1,2,3-Trichloropropane	96-18-4	37	0	0%	0.001	0.000	-	-	0.003
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	176	0	0%	0.011	0.060	-	-	0.012
VOCs	1,2,4-Trimethylbenzene	95-63-6	39	2	5%	1.001	4.242	S0034-DU-0106-31-V	18.000	0.001
VOCs	1,3,5-Trimethylbenzene	108-67-8	38	1	3%	1.334	5.657	S0034-DU-0612-31-V	24.000	0.001
VOCs	Vinyl chloride	75-01-4	176	1	1%	0.008	0.031	S0002-DU-1218-31-V	0.039	0.007

Table A-7. Surficial Soil Summary – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
VOCs	m,p-Xylene	179601-23-1	176	3	2%	0.124	0.768	S0034-DU-0106-31-V	4.800	0.005
VOCs	o-Xylene	95-47-6	176	3	2%	0.063	0.384	S0034-DU-0106-31-V	2.400	0.005

Notes:
SVOCs: Semi volatile organic compounds
VOCs: Volatile organic compounds
MDL: Method detection limit
mg/kg: Milligram per kilogram

Table A-8. Surficial Soil Summary – OU1 Runyon Park – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
Metals	Antimony	7440-36-0	14	14	100%	6.119	4.176	S1922-Q-0612-31-ICP	16.400	0.118
Metals	Arsenic	7440-38-2	128	128	100%	22.534	15.230	S1922-FF-1218-31	60.500	-
Metals	Barium	7440-39-3	14	14	100%	168.450	35.727	S1922-H-1218-31-ICP	250.000	0.436
Metals	Beryllium	7440-41-7	14	14	100%	0.576	0.077	S1922-Z-0001-31-ICP	0.750	0.045
Metals	Cadmium	7440-43-9	14	14	100%	3.851	1.980	S1922-AA-0612-01-ICP	8.900	0.050
Metals	Chromium	7440-47-3	14	14	100%	21.579	15.964	S1922-AA-0612-01-ICP	66.500	0.112
Metals	Chromium, Hexavalent	18540-29-9	127	118	93%	2.763	4.101	S1922-AA-0001-01	18.400	0.003
Metals	Cobalt	7440-48-4	14	14	100%	4.579	0.946	S1922-FF-1218-31-ICP	6.300	0.059
Metals	Copper	7440-50-8	128	128	100%	105.071	84.676	S1922-FF-1218-31	379.000	-
Metals	Lead	7439-92-1	128	128	100%	469.467	416.395	S1922-FF-1218-31	1,490.000	-
Metals	Manganese	7439-96-5	128	128	100%	586.521	127.636	S1922-GG-0001-31	1,070.000	-
Metals	Mercury	7439-97-6	128	56	44%	0.105	0.105	S1922-E-0612-31	0.400	0.008
Metals	Nickel	7440-02-0	14	14	100%	89.693	50.930	S1922-G-1218-31-ICP	167.000	0.165
Metals	Selenium	7782-49-2	14	1	7%	0.246	0.336	S1922-R-1218-01-ICP	1.400	0.313
Metals	Silver	7440-22-4	14	13	93%	0.914	0.754	S1922-AA-0612-01-ICP	2.700	0.054
Metals	Thallium	7440-28-0	14	0	0%	0.035	0.012	-	-	0.069
Metals	Vanadium	7440-62-2	14	14	100%	15.679	2.534	S1922-T-1218-31-ICP	21.400	0.264
Metals	Zinc	7440-66-6	128	128	100%	532.417	404.115	S1922-FF-1218-31	1,630.000	-
SVOCs	Acenaphthene	83-32-9	128	124	97%	0.098	0.165	S1922-F-0612-31	0.750	0.000
SVOCs	Acenaphthylene	208-96-8	128	128	100%	0.060	0.084	S1922-E-0612-31	0.257	0.001
SVOCs	Acetophenone	98-86-2	128	8	6%	21.203	3.878	S1922-E-0106-31	11.346	0.039
SVOCs	Anthracene	120-12-7	128	128	100%	0.215	0.366	S1922-F-0106-31	1.400	0.001
SVOCs	Atrazine	1912-24-9	128	0	0%	17.755	1.484	-	-	0.034
SVOCs	Benzaldehyde	100-52-7	128	7	5%	16.901	2.892	S1922-E-0612-31	9.346	0.031
SVOCs	Benzo(a)anthracene	56-55-3	128	128	100%	1.165	2.988	S1922-F-0612-31	14.000	0.003
SVOCs	Benzo(a)pyrene	50-32-8	128	128	100%	1.778	6.734	S1922-E-0612-31	38.133	0.003
SVOCs	Benzo(b)fluoranthene	205-99-2	128	128	100%	2.409	9.248	S1922-E-0612-31	52.333	0.003
SVOCs	Benzo(g,h,i)perylene	191-24-2	128	128	100%	0.600	1.974	S1922-E-0612-31	11.243	0.002
SVOCs	Benzo(k)fluoranthene	207-08-9	128	128	100%	0.645	2.303	S1922-E-0612-31	13.037	0.002

Table A-8. Surficial Soil Summary – OU1 Runyon Park – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
SVOCs	1,1'-Biphenyl	92-52-4	128	7	5%	17.932	4.658	S1922-F-0612-31	0.220	0.032
SVOCs	4-Bromophenyl-phenylether	101-55-3	128	0	0%	20.453	3.729	-	-	0.038
SVOCs	Butylbenzylphthalate	85-68-7	128	0	0%	28.182	3.253	-	-	0.053
SVOCs	Caprolactam	105-60-2	128	2	2%	16.948	2.907	S1922-L-0106-01	0.037	0.031
SVOCs	Carbazole	86-74-8	128	22	17%	18.764	6.243	S1922-X-1218-31	15.686	0.036
SVOCs	4-Chloroaniline	106-47-8	128	1	1%	12.729	2.875	S1922-DD-1218-31	0.390	0.023
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	128	0	0%	20.500	4.677	-	-	0.037
SVOCs	Bis(2-Chloroethyl) ether	111-44-4	128	0	0%	24.354	7.440	-	-	0.043
SVOCs	4-Chloro-3-methylphenol	59-50-7	128	0	0%	16.526	2.409	-	-	0.031
SVOCs	2-Chloronaphthalene	91-58-7	128	0	0%	19.698	5.931	-	-	0.035
SVOCs	2-Chlorophenol	95-57-8	128	0	0%	21.729	6.246	-	-	0.039
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	128	0	0%	19.391	2.974	-	-	0.036
SVOCs	Chrysene	218-01-9	128	128	100%	1.011	2.385	S1922-F-0612-31	11.000	0.003
SVOCs	Dibenzo(a,h)anthracene	53-70-3	128	128	100%	0.188	0.680	S1922-E-0612-31	3.860	0.001
SVOCs	Dibenzofuran	132-64-9	128	21	16%	18.348	6.692	S1922-X-1218-31	15.688	0.035
SVOCs	3,3'-Dichlorobenzidine	91-94-1	128	0	0%	26.771	2.957	-	-	0.050
SVOCs	2,4-Dichlorophenol	120-83-2	128	0	0%	17.161	3.428	-	-	0.031
SVOCs	Diethylphthalate	84-66-2	128	0	0%	18.630	3.996	-	-	0.034
SVOCs	2,4-Dimethylphenol	105-67-9	128	0	0%	30.141	5.381	-	-	0.056
SVOCs	Dimethylphthalate	131-11-3	128	0	0%	18.557	4.293	-	-	0.034
SVOCs	Di-n-butylphthalate	84-74-2	128	0	0%	18.552	1.622	-	-	0.035
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	119	0	0%	19.708	2.176	-	-	0.037
SVOCs	2,4-Dinitrophenol	51-28-5	119	0	0%	12.697	1.381	-	-	0.024
SVOCs	2,4-Dinitrotoluene	121-14-2	128	0	0%	20.156	3.078	-	-	0.037
SVOCs	2,6-Dinitrotoluene	606-20-2	128	0	0%	16.740	2.588	-	-	0.031
SVOCs	Di-n-octylphthalate	117-84-0	128	0	0%	20.094	2.511	-	-	0.037
SVOCs	1,4-Dioxane	123-91-1	128	0	0%	20.823	9.952	-	-	0.035
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	128	36	28%	18.422	1.454	S1922-X-0001-31	11.512	0.036
SVOCs	Fluoranthene	206-44-0	128	128	100%	0.903	1.256	S1922-F-0106-31	4.400	0.002

Table A-8. Surficial Soil Summary – OU1 Runyon Park – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
SVOCs	Fluorene	86-73-7	128	118	92%	0.104	0.156	S1922-F-0612-31	0.710	0.000
SVOCs	Hexachlorobenzene	118-74-1	128	0	0%	20.964	5.836	-	-	0.037
SVOCs	Hexachlorobutadiene	87-68-3	128	0	0%	22.464	6.808	-	-	0.040
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	128	0	0%	16.573	8.603	-	-	0.028
SVOCs	Hexachloroethane	67-72-1	128	0	0%	22.729	5.709	-	-	0.041
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	128	128	100%	0.706	2.407	S1922-E-0612-31	13.693	0.003
SVOCs	Isophorone	78-59-1	128	0	0%	20.396	3.754	-	-	0.037
SVOCs	2-Methylnaphthalene	91-57-6	128	127	99%	0.213	0.817	S1922-F-0612-31	0.840	0.001
SVOCs	2-Methylphenol	95-48-7	128	0	0%	19.458	6.423	-	-	0.034
SVOCs	4-Methylphenol	106-44-5	128	0	0%	21.432	6.034	-	-	0.038
SVOCs	Naphthalene	91-20-3	128	121	95%	0.240	0.756	S1922-F-0612-31	1.100	0.001
SVOCs	2-Nitroaniline	88-74-4	128	0	0%	16.703	3.213	-	-	0.031
SVOCs	3-Nitroaniline	99-09-2	128	0	0%	15.510	2.207	-	-	0.029
SVOCs	4-Nitroaniline	100-01-6	128	0	0%	17.203	2.052	-	-	0.032
SVOCs	Nitrobenzene	98-95-3	78	0	0%	15.764	1.144	-	-	0.030
SVOCs	2-Nitrophenol	88-75-5	128	0	0%	20.891	4.046	-	-	0.038
SVOCs	4-Nitrophenol	100-02-7	128	0	0%	23.026	2.766	-	-	0.043
SVOCs	N-Nitroso-di-n propylamine	621-64-7	128	0	0%	18.927	2.590	-	-	0.035
SVOCs	N-Nitrosodiphenylamine	86-30-6	128	0	0%	20.656	3.815	-	-	0.038
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	128	0	0%	22.729	5.251	-	-	0.041
SVOCs	Pentachlorophenol	87-86-5	128	65	51%	3.955	6.713	S1922-X-1218-31	0.267	0.005
SVOCs	Phenanthrene	85-01-8	128	128	100%	0.714	1.131	S1922-F-0106-31	4.500	0.002
SVOCs	Phenol	108-95-2	128	1	1%	18.781	4.214	S1922-D-0106-31	0.037	0.034
SVOCs	Pyrene	129-00-0	128	128	100%	1.132	2.194	S1922-F-0612-31	10.000	0.004
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	128	0	0%	20.786	7.939	-	-	0.036
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	128	0	0%	16.578	3.992	-	-	0.030
SVOCs	2,4,5-Trichlorophenol	95-95-4	128	0	0%	19.349	3.682	-	-	0.035
SVOCs	2,4,6-Trichlorophenol	88-06-2	128	0	0%	17.661	3.870	-	-	0.032
VOCs	Acetone	67-64-1	126	91	72%	0.845	0.770	S1922-AA-1218-01-VOA	0.110	0.003

Table A-8. Surficial Soil Summary – OU1 Runyon Park – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
VOCs	Benzene	71-43-2	125	1	1%	0.078	0.040	S1922-G-0612-31-VOA	0.022	0.000
VOCs	Bromochloromethane	74-97-5	126	0	0%	0.110	0.065	-	-	0.000
VOCs	Bromodichloromethane	75-27-4	125	0	0%	0.072	0.024	-	-	0.000
VOCs	Bromoform	75-25-2	119	0	0%	0.076	0.023	-	-	0.000
VOCs	Bromomethane	74-83-9	126	0	0%	0.241	0.111	-	-	0.000
VOCs	2-Butanone	78-93-3	126	1	1%	1.596	0.545	S1922-P-1218-01-VOA	0.010	0.003
VOCs	Carbon disulfide	75-15-0	126	13	10%	0.057	0.025	S1922-E-0612-31-VOA	0.045	0.000
VOCs	Carbon tetrachloride	56-23-5	125	0	0%	0.058	0.027	-	-	0.000
VOCs	Chlorobenzene	108-90-7	125	0	0%	0.077	0.029	-	-	0.000
VOCs	Chloroethane	75-00-3	126	0	0%	0.148	0.064	-	-	0.000
VOCs	Chloroform	67-66-3	126	2	2%	0.227	0.131	S1922-P-0612-01-VOA	0.005	0.000
VOCs	Chloromethane	74-87-3	126	0	0%	0.075	0.040	-	-	0.000
VOCs	Cyclohexane	110-82-7	126	7	6%	0.072	0.040	S1922-AA-1218-01-VOA	0.006	0.000
VOCs	Dibromochloromethane	124-48-1	125	0	0%	0.064	0.034	-	-	0.000
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	119	0	0%	0.414	0.230	-	-	0.001
VOCs	1,2-Dibromoethane	106-93-4	125	0	0%	0.109	0.044	-	-	0.000
VOCs	1,2-Dichlorobenzene	95-50-1	119	0	0%	0.098	0.051	-	-	0.000
VOCs	1,3-Dichlorobenzene	541-73-1	119	0	0%	0.083	0.032	-	-	0.000
VOCs	1,4-Dichlorobenzene	106-46-7	119	0	0%	0.072	0.027	-	-	0.000
VOCs	Dichlorodifluoromethane	75-71-8	126	0	0%	0.167	0.071	-	-	0.000
VOCs	1,1-Dichloroethane	75-34-3	126	0	0%	0.075	0.029	-	-	0.000
VOCs	1,2-Dichloroethane	107-06-2	126	0	0%	0.092	0.056	-	-	0.000
VOCs	1,1-Dichloroethene	75-35-4	126	0	0%	0.097	0.033	-	-	0.000
VOCs	cis-1,2-Dichloroethene	156-59-2	126	0	0%	0.063	0.021	-	-	0.000
VOCs	trans-1,2-Dichloroethene	156-60-5	126	0	0%	0.061	0.020	-	-	0.000
VOCs	1,2-Dichloropropane	78-87-5	125	0	0%	0.103	0.068	-	-	0.000
VOCs	cis-1,3-Dichloropropene	10061-01-5	125	0	0%	0.321	0.223	-	-	0.001
VOCs	trans-1,3-Dichloropropene	10061-02-6	125	0	0%	0.125	0.052	-	-	0.000
VOCs	Ethylbenzene	100-41-4	125	3	2%	0.073	0.036	S1922-AA-0612-01-VOA	0.001	0.000

Table A-8. Surficial Soil Summary – OU1 Runyon Park – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
VOCs	2-Hexanone	591-78-6	125	0	0%	1.471	0.431	-	-	0.002
VOCs	Isopropylbenzene	98-82-8	125	1	1%	0.050	0.017	S1922-AA-0612-01-VOA	0.000	0.000
VOCs	Methyl acetate	79-20-9	126	3	2%	0.649	0.274	S1922-R-0001-01-VOA	0.096	0.001
VOCs	Methyl tert-butyl ether	1634-04-4	126	0	0%	0.087	0.055	-	-	0.000
VOCs	Methylene chloride	75-09-2	126	0	0%	0.056	0.025	-	-	0.000
VOCs	Methylcyclohexane	108-87-2	126	1	1%	0.113	0.087	S1922-AA-1218-01-VOA	0.004	0.000
VOCs	4-Methyl-2-pentanone	108-10-1	125	0	0%	0.458	0.199	-	-	0.001
VOCs	Styrene	100-42-5	125	0	0%	0.062	0.024	-	-	0.000
VOCs	Tetrachloroethene	127-18-4	125	11	9%	0.053	0.023	S1922-G-0612-31-VOA	0.020	0.000
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	125	0	0%	0.096	0.034	-	-	0.000
VOCs	Toluene	108-88-3	126	41	33%	0.043	0.024	S1922-AA-0612-01-VOA	0.003	0.000
VOCs	1,1,1-Trichloroethane	71-55-6	125	0	0%	0.071	0.044	-	-	0.000
VOCs	1,1,2-Trichloroethane	79-00-5	125	0	0%	0.088	0.032	-	-	0.000
VOCs	1,2,3-Trichlorobenzene	87-61-6	100	0	0%	0.169	0.053	-	-	0.000
VOCs	1,2,4-Trichlorobenzene	120-82-1	119	0	0%	0.156	0.051	-	-	0.000
VOCs	Trichloroethene	79-01-6	125	22	18%	0.068	0.030	S1922-Y-0106-31-VOA	0.001	0.000
VOCs	Trichlorofluoromethane	75-69-4	126	3	2%	0.089	0.065	S1922-AA-1218-01-VOA	0.002	0.000
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	126	0	0%	0.147	0.094	-	-	0.000
VOCs	Vinyl chloride	75-01-4	126	0	0%	0.089	0.035	-	-	0.000
VOCs	m, p-Xylene	179601-23-1	126	12	10%	0.070	0.028	S1922-AA-0612-01-VOA	0.004	0.000
VOCs	o-Xylene	95-47-6	126	6	5%	0.072	0.025	S1922-AA-0612-01-VOA	0.003	0.000
Inorganic	%TS	N679	128	128	100%	94.644	3.105	S1922-P-0001-01	98.480	0.010

Notes:

SVOCs: Semi volatile organic compounds

VOCs: Volatile organic compounds

MDL: Method detection limit

mg/kg: Milligram per kilogram

Table A-9. Surficial Soil Summary – OU1 Benedict Park – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
Metals	Antimony	7440-36-0	13	13	100%	1.634	0.931	S1056-F-1218-31-ICP	3.000	0.047
Metals	Arsenic	7440-38-2	28	28	100%	230.487	251.653	S1056-G-0612-31	657.000	-
Metals	Barium	7440-39-3	13	13	100%	197.571	64.810	S1056-F-0106-31-ICP	323.000	0.191
Metals	Beryllium	7440-41-7	13	13	100%	0.566	0.103	S1056-D-0106-31-ICP	0.670	0.027
Metals	Cadmium	7440-43-9	13	13	100%	37.814	31.209	S1056-C-0612-31-ICP	71.300	0.036
Metals	Chromium	7440-47-3	13	13	100%	9.914	3.197	S1056-A-0001-31-ICP	13.900	0.048
Metals	Cobalt	7440-48-4	13	13	100%	4.829	0.626	S1056-F-0106-31-ICP	5.800	0.022
Metals	Copper	7440-50-8	28	28	100%	86.786	42.282	S1056-F-0106-31	161.000	-
Metals	Lead	7439-92-1	28	28	100%	537.143	231.441	S1056-E-1218-31	880.000	-
Metals	Manganese	7439-96-5	28	28	100%	612.429	98.178	S1056-E-1218-31	785.000	-
Metals	Nickel	7440-02-0	13	13	100%	50.943	32.952	S1056-A-1218-31-ICP	118.000	0.029
Metals	Selenium	7782-49-2	7	2	29%	0.389	0.525	S1056-F-1218-31-ICP	1.300	0.169
Metals	Silver	7440-22-4	13	13	100%	1.366	0.957	S1056-F-1218-31-ICP	3.000	0.021
Metals	Thallium	7440-28-0	10	7	70%	0.457	0.397	S1056-G-0001-31-ICP	1.100	0.034
Metals	Vanadium	7440-62-2	13	13	100%	24.371	3.157	S1056-G-0001-31-ICP	29.800	0.110
Metals	Zinc	7440-66-6	28	28	100%	444.286	196.599	S1056-E-1218-31	871.000	-

Notes:

MDL: Method detection limit

mg/kg: Milligram per kilogram

Table A-10. Surficial Soil Summary – OU1 Bessemer Park – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
Metals	Antimony	7440-36-0	11	6	55%	0.458	0.293	S1980-D-0106-31-ICP	0.830	0.048
Metals	Arsenic	7440-38-2	20	20	100%	11.960	0.808	S1980-C-0106-31	13.000	-
Metals	Barium	7440-39-3	11	11	100%	135.200	7.563	S1980-A-0001-31-ICP	147.000	0.202
Metals	Beryllium	7440-41-7	11	11	100%	0.534	0.017	S1980-D-0612-31-ICP	0.560	0.026
Metals	Cadmium	7440-43-9	11	11	100%	2.680	0.427	S1980-C-0106-31-ICP	3.300	0.038
Metals	Chromium	7440-47-3	11	11	100%	11.500	1.991	S1980-E-0001-31-ICP	14.700	0.048
Metals	Cobalt	7440-48-4	11	11	100%	5.540	0.182	S1980-A-0106-31-ICP; S1980-D-0612-31-ICP	5.700	0.023
Metals	Copper	7440-50-8	20	20	100%	69.780	9.085	S1980-B-0106-31	79.200	-
Metals	Lead	7439-92-1	20	20	100%	151.467	21.915	S1980-C-0106-31	187.000	-
Metals	Manganese	7439-96-5	20	20	100%	506.933	37.912	S1980-C-0106-31	569.000	-
Metals	Nickel	7440-02-0	11	11	100%	36.540	12.943	S1980-C-1218-31-ICP	54.800	0.028
Metals	Selenium	7782-49-2	5	0	0%	0.078	0.007	-	-	0.156
Metals	Silver	7440-22-4	11	10	91%	1.092	0.433	S1980-A-0001-31-ICP	1.600	0.023
Metals	Thallium	7440-28-0	7	2	29%	0.102	0.104	S1980-D-0106-31-ICP	0.230	0.040
Metals	Vanadium	7440-62-2	11	11	100%	23.700	1.158	S1980-C-1218-31-ICP	25.100	0.109
Metals	Zinc	7440-66-6	20	20	100%	323.667	46.066	S1980-C-0001-31	379.000	-

Notes:

MDL: Method detection limit

mg/kg: Milligram per kilogram

Table A-11. Surficial Soil Summary – OU1 Bessemer School Park – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
Metals	Antimony	7440-36-0	4	3	75%	0.439	0.357	S0962-B-0001-01-ICP	0.720	0.039
Metals	Arsenic	7440-38-2	16	16	100%	9.243	1.883	S0962-B-0612-01	11.400	-
Metals	Barium	7440-39-3	9	9	100%	137.500	21.992	S0962-D-0612-01-ICP	159.000	0.074
Metals	Beryllium	7440-41-7	9	9	100%	0.463	0.026	S0962-C-0106-31-ICP	0.490	0.012
Metals	Cadmium	7440-43-9	9	9	100%	1.623	0.914	S0962-B-0106-01-ICP	2.900	0.027
Metals	Chromium	7440-47-3	9	9	100%	10.450	1.718	S0962-B-0001-01-ICP	12.600	0.017
Metals	Cobalt	7440-48-4	9	9	100%	5.350	0.794	S0962-C-0106-31-ICP	6.500	0.009
Metals	Copper	7440-50-8	16	16	100%	40.363	13.287	S0962-B-0106-01	59.100	-
Metals	Lead	7439-92-1	16	16	100%	134.950	109.994	S0962-B-0106-01	290.000	-
Metals	Manganese	7439-96-5	16	16	100%	443.250	41.700	S0962-B-0106-01	505.000	-
Metals	Nickel	7440-02-0	9	9	100%	24.325	3.457	S0962-D-0106-01-ICP	28.700	0.018
Metals	Selenium	7782-49-2	1	0	0%	0.075	-	-	-	0.150
Metals	Silver	7440-22-4	7	7	100%	0.388	0.200	S0962-B-0106-01-ICP	0.680	0.013
Metals	Thallium	7440-28-0	1	1	100%	0.160	-	S0962-D-0612-01-ICP	0.160	0.048
Metals	Vanadium	7440-62-2	9	9	100%	24.650	4.791	S0962-D-0612-01-ICP	31.000	0.031
Metals	Zinc	7440-66-6	16	16	100%	232.250	105.092	S0962-B-0106-01	374.000	-

Notes:

MDL: Method detection limit

mg/kg: Milligram per kilogram

Table A-12. Surficial Soil Summary – OU1 Moynihan Park – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
Metals	Antimony	7440-36-0	10	10	100%	1.242	0.203	S2280-A-0001-31-ICP; S2280-A-0106-31-ICP; S2280-D-0106-31-ICP	1.400	0.008
Metals	Arsenic	7440-38-2	27	27	100%	15.940	3.629	S2280-C-1218-31	19.300	-
Metals	Barium	7440-39-3	10	10	100%	232.800	29.304	S2280-D-0106-31-ICP	284.000	0.030
Metals	Beryllium	7440-41-7	10	10	100%	0.718	0.140	S2280-D-0106-31-ICP	0.900	0.008
Metals	Cadmium	7440-43-9	10	10	100%	2.540	0.321	S2280-PA-0106-31-ICP	3.100	0.010
Metals	Chromium	7440-47-3	10	10	100%	14.700	1.500	S2280-A-0001-31-ICP	15.800	0.027
Metals	Cobalt	7440-48-4	10	10	100%	5.540	0.251	S2280-PA-0106-31-ICP	5.900	0.006
Metals	Copper	7440-50-8	27	27	100%	75.000	14.738	S2280-APW-0001-01	90.300	-
Metals	Lead	7439-92-1	27	27	100%	324.643	118.595	S2280-B-0612-31	509.000	-
Metals	Manganese	7439-96-5	27	27	100%	475.857	61.174	S2280-D-0106-31	570.000	-
Metals	Nickel	7440-02-0	10	10	100%	52.200	57.738	S2280-PA-0001-31-ICP	155.000	0.011
Metals	Selenium	7782-49-2	10	10	100%	2.168	0.856	S2280-A-0001-31-ICP; S2280-C-0001-31-ICP	2.600	0.104
Metals	Silver	7440-22-4	10	10	100%	2.084	0.667	S2280-D-0001-31-ICP	2.600	0.007
Metals	Thallium	7440-28-0	10	0	0%	0.004	0.000	-	-	0.007
Metals	Vanadium	7440-62-2	10	10	100%	23.100	0.837	S2280-A-0106-31-ICP	24.100	0.010
Metals	Zinc	7440-66-6	27	27	100%	333.643	80.411	S2280-D-0106-31	464.000	-

Notes:

MDL: Method detection limit

mg/kg: Milligram per kilogram

Table A-13. Surficial Soil Summary – OU1 Stauter Field – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
Metals	Antimony	7440-36-0	12	9	75%	0.542	0.039	S0505-B-0001-31-ICP; S0505-E-0001-31-ICP	0.580	0.057
Metals	Arsenic	7440-38-2	20	20	100%	8.684	1.570	S0505-D-0612-31	11.100	-
Metals	Barium	7440-39-3	12	12	100%	160.800	25.704	S0505-C-1218-31-ICP	195.000	0.242
Metals	Beryllium	7440-41-7	12	12	100%	0.492	0.054	S0505-B-0106-31-ICP	0.570	0.031
Metals	Cadmium	7440-43-9	12	12	100%	1.640	0.195	S0505-A-0612-31-ICP	1.900	0.044
Metals	Chromium	7440-47-3	12	12	100%	13.200	3.663	S0505-B-0001-31-ICP; S0505-C-0001-31-ICP	17.100	0.058
Metals	Cobalt	7440-48-4	12	12	100%	5.080	0.444	S0505-B-0106-31-ICP	5.800	0.027
Metals	Copper	7440-50-8	20	20	100%	60.700	15.320	S0505-B-1218-31	87.200	-
Metals	Lead	7439-92-1	20	20	100%	123.580	43.187	S0505-B-1218-31	184.000	-
Metals	Manganese	7439-96-5	20	20	100%	432.000	37.423	S0505-B-1218-31	478.000	-
Metals	Nickel	7440-02-0	12	12	100%	33.560	4.313	S0505-D-0106-31-ICP	37.600	0.033
Metals	Selenium	7782-49-2	5	1	20%	0.367	0.578	S0505-B-0106-31-ICP	1.400	0.204
Metals	Silver	7440-22-4	12	10	83%	0.670	0.319	S0505-B-0106-31-ICP	1.100	0.027
Metals	Thallium	7440-28-0	5	2	40%	0.085	0.082	S0505-C-1218-31-ICP	0.180	0.067
Metals	Vanadium	7440-62-2	12	12	100%	23.260	2.038	S0505-C-1218-31-ICP	25.900	0.131
Metals	Zinc	7440-66-6	20	20	100%	212.400	38.630	S0505-A-0001-31	268.000	-

Notes:

MDL: Method detection limit

mg/kg: Milligram per kilogram

Table A-14. Soil Summary – Union Pacific ROW Soil – Analytes

Chemical Group	Analyte	CAS Number	Total Sample Number	Detect	Detection Frequency	Average Concentration (mg/kg)	Standard Deviation (mg/kg)	Sample_No of Max	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)
Metals	Aluminum	7429-90-5	13	13	100%	10,421.462	3,128.610	SL-ECO-05-00-02	16,800.000	0.560
Metals	Antimony	7440-36-0	13	3	23%	1.774	3.526	SL-ECO-05-00-02	10.600	0.022
Metals	Arsenic	7440-38-2	13	13	100%	30.985	32.989	SL-ECO-04-00-02	128.850	0.018
Metals	Barium	7440-39-3	13	13	100%	836.146	763.182	SL-ECO-05-00-02	2,440.000	0.063
Metals	Beryllium	7440-41-7	13	0	0%	0.014	0.000	-	-	0.027
Metals	Cadmium	7440-43-9	13	13	100%	4.685	1.735	SL-ECO-05-00-02	7.700	0.011
Metals	Chromium	7440-47-3	13	13	100%	24.162	7.226	SL-ECO-03-00-02	33.400	0.067
Metals	Cobalt	7440-48-4	13	12	92%	6.607	2.655	SL-ECO-03-00-02	10.500	0.020
Metals	Copper	7440-50-8	13	13	100%	231.435	199.430	SL-ECO-05-00-02	657.000	0.036
Metals	Iron	7439-89-6	13	13	100%	33,840.000	13,536.105	SL-ECO-05-00-02	57,700.000	0.600
Metals	Lead	7439-92-1	13	13	100%	1,178.500	1,131.786	SL-ECO-05-00-02	3,810.000	0.023
Metals	Manganese	7439-96-5	13	13	100%	4,263.038	5,209.569	SL-ECO-05-00-02	16,700.000	0.034
Metals	Mercury	7439-97-6	13	13	100%	0.148	0.094	SL-ECO-05-00-02	0.430	0.024
Metals	Nickel	7440-02-0	13	13	100%	17.708	5.605	SL-ECO-03-00-02	28.000	0.050
Metals	Selenium	7782-49-2	13	3	23%	1.085	2.264	SL-ECO-14-00-02	6.100	0.022
Metals	Silver	7440-22-4	13	6	46%	2.275	2.950	SL-ECO-05-00-02	8.900	0.035
Metals	Thallium	7440-28-0	13	0	0%	0.009	0.000	-	-	0.017
Metals	Vanadium	7440-62-2	13	13	100%	39.918	14.260	SL-ECO-11-00-02	71.300	0.057
Metals	Zinc	7440-66-6	13	13	100%	4,368.654	5,250.594	SL-ECO-05-00-02	17,900.000	0.110

Notes:

MDL: Method detection limit

mg/kg: Milligram per kilogram

Appendix B - Biota Data Summary

Table B1-1. Sample Summary – Fish Tissue

Fish Sample ID	Sample Date	Location	Species
2022-11-ARK-RBT-C1	11/15/22	Upstream Arkansas River	Rainbow Trout
2022-11-ARK-RBT-C2	11/15/22	Upstream Arkansas River	Rainbow Trout
2022-11-ARK-RBT-C3	11/15/22	Upstream Arkansas River	Rainbow Trout
2022-11-ARK-LOC-C1	11/17/22	Upstream Arkansas River	Brown Trout
2022-11-ARK-LOC-C2	11/17/22	Upstream Arkansas River	Brown Trout
2022-11-ARK-LOC-C3	11/17/22	Upstream Arkansas River	Brown Trout
2023-10-ARK-LOC-C1	10/19/23	Downstream Arkansas River	Brown Trout
2023-10-ARK-RBT-C1	10/19/23	Downstream Arkansas River	Rainbow Trout
2023-10-ARK-RBT-C2	10/19/23	Downstream Arkansas River	Rainbow Trout
2023-10-ARK-RBT-C3	10/19/23	Downstream Arkansas River	Rainbow Trout
2023-10-FTN-CAT-C1	10/11/23	Fountain Lake	Channel Catfish
2023-10-FTN-CAT-C2	10/11/23	Fountain Lake	Channel Catfish
2023-10-FTN-RBT-C1	10/11/23	Fountain Lake	Rainbow Trout
2023-10-FTN-RBT-C2	10/11/23	Fountain Lake	Rainbow Trout
2023-10-FTN-RBT-C3	10/11/23	Fountain Lake	Rainbow Trout
2023-10-RYN-CAT-C1	10/11/23	Runyon Lake	Channel Catfish
2023-10-RYN-CAT-C2	10/11/23	Runyon Lake	Channel Catfish
2023-10-RYN-CAT-C3	10/11/23	Runyon Lake	Channel Catfish
2023-7-RYN-RBT-C1	07/18/23	Runyon Lake	Rainbow Trout
2023-7-RYN-RBT-C2	07/18/23	Runyon Lake	Rainbow Trout
2023-7-RYN-RBT-C3	07/18/23	Runyon Lake	Rainbow Trout
2023-7-RYN-SAU-C1	07/18/23	Runyon Lake	Saugeye
2023-7-RYN-SAU-C2	07/18/23	Runyon Lake	Saugeye
2023-7-RYN-SAU-C3	07/18/23	Runyon Lake	Saugeye
2023-7-RYN-WAL-C1	07/18/23	Runyon Lake	Walleye

Table B1-2. Summary – Fish Tissue

Analyte	Total Sample Number	Detect	Detection Frequency	Maximum Detected Concentration (mg/kg dry)	Minimum Detected Concentration (mg/kg dry)	Maximum Non-Detect MDL (mg/kg dry)	½ Maximum MDL if All Non-Detect (mg/kg dry)
Aluminum	25	3	12%	105.566	72.504	101.000	-
Antimony	25	2	8%	0.537	0.523	1.010	-
Arsenic	25	19	76%	2.075	0.787	0.999	-
Barium	25	15	60%	9.393	0.715	10.100	-
Beryllium	25	0	0%	-	-	5.050	2.525
Cadmium	25	2	8%	0.150	0.114	0.202	-
Calcium	25	25	100%	47,714.928	2,554.459	-	-
Chromium	25	25	100%	6.032	3.515	-	-
Cobalt	25	25	100%	0.449	0.123	-	-
Copper	25	25	100%	11.583	0.874	-	-
Iron	25	7	28%	216.849	107.353	253.000	-
Lead	25	16	64%	0.431	0.116	0.200	-
Magnesium	25	25	100%	1,502.837	811.447	-	-
Manganese	25	16	64%	124.002	7.716	15.200	-
Mercury	25	21	84%	0.250	0.050	0.050	-
Nickel	25	25	100%	4.105	0.687	-	-
Potassium	25	25	100%	16,611.269	10,476.701	-	-
Selenium	25	25	100%	16.708	1.058	-	-
Silver	25	0	0%	-	-	1.010	0.505
Sodium	25	25	100%	4,697.208	2,304.873	-	-
Thallium	25	0	0%	-	-	2.025	1.012
Vanadium	25	1	4%	2.285	2.285	3.410	-
Zinc	25	25	100%	288.844	35.501	-	-

Notes:

MDL: Method detection limit

mg/kg: Milligram per kilogram

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
2023-10-ARK-RBT-C1	Mercury	N	0.05	N	559.00	0.05	N	248.61	0.05	U
2023-10-ARK-RBT-C1	Beryllium	N	2	N	559.00	2.00	N	248.61	2.00	U
2023-10-ARK-RBT-C1	Manganese	N	55.7	Y	559.00	7.50	N	248.61	40.86	J
2023-10-ARK-RBT-C1	Zinc	N	165	Y	559.00	29.80	N	248.61	123.38	J
2023-10-ARK-RBT-C1	Aluminum	N	49.4	N	559.00	49.70	N	248.61	49.49	U
2023-10-ARK-RBT-C1	Lead	N	0.198	N	559.00	0.10	N	248.61	0.17	U
2023-10-ARK-RBT-C1	Iron	N	98.8	N	559.00	99.30	N	248.61	98.95	U
2023-10-ARK-RBT-C1	Cobalt	N	0.327	Y	559.00	0.10	N	248.61	0.26	J
2023-10-ARK-RBT-C1	Cadmium	N	0.198	N	559.00	0.10	N	248.61	0.17	U
2023-10-ARK-RBT-C1	Nickel	N	5.71	Y	559.00	0.50	N	248.61	4.11	J
2023-10-ARK-RBT-C1	Silver	N	0.988	N	559.00	0.50	N	248.61	0.84	U
2023-10-ARK-RBT-C1	Barium	N	4	Y	559.00	0.50	N	248.61	2.92	J
2023-10-ARK-RBT-C1	Antimony	N	0.988	N	559.00	0.50	N	248.61	0.84	U
2023-10-ARK-RBT-C1	Arsenic	N	0.988	N	559.00	0.85	Y	248.61	0.95	J
2023-10-ARK-RBT-C1	Thallium	N	1.98	N	559.00	0.99	N	248.61	1.68	U
2023-10-ARK-RBT-C1	Magnesium	N	1570	Y	559.00	1,180.00	Y	248.61	1,449.94	
2023-10-ARK-RBT-C1	Copper	N	3.55	Y	559.00	1.22	Y	248.61	2.83	
2023-10-ARK-RBT-C1	Vanadium	N	3.95	N	559.00	1.99	N	248.61	3.35	U
2023-10-ARK-RBT-C1	Sodium	N	4000	Y	559.00	2,520.00	Y	248.61	3,544.41	
2023-10-ARK-RBT-C1	Calcium	N	67100	Y	559.00	3,660.00	Y	248.61	47,571.00	
2023-10-ARK-RBT-C1	Chromium	N	3.57	Y	559.00	4.88	Y	248.61	3.97	
2023-10-ARK-RBT-C1	Selenium	N	7.06	Y	559.00	10.20	Y	248.61	8.03	
2023-10-ARK-RBT-C1	Potassium	N	7720	Y	559.00	18,400.00	Y	248.61	11,007.67	
2023-10-ARK-RBT-C2	Mercury	N	0.05	N	200.26	0.05	Y	200.05	0.05	J
2023-10-ARK-RBT-C2	Beryllium	N	2	N	200.26	2.00	N	200.05	2.00	U
2023-10-ARK-RBT-C2	Manganese	N	93.6	Y	200.26	7.50	N	200.05	50.57	J
2023-10-ARK-RBT-C2	Zinc	N	144	Y	200.26	30.00	N	200.05	87.03	J
2023-10-ARK-RBT-C2	Aluminum	N	49.7	N	200.26	50.00	N	200.05	49.85	U
2023-10-ARK-RBT-C2	Lead	N	0.218	Y	200.26	0.10	N	200.05	0.16	J
2023-10-ARK-RBT-C2	Iron	N	137	Y	200.26	100.00	N	200.05	118.51	J
2023-10-ARK-RBT-C2	Cobalt	N	0.434	Y	200.26	0.10	Y	200.05	0.27	
2023-10-ARK-RBT-C2	Cadmium	N	0.0994	N	200.26	0.10	N	200.05	0.10	U
2023-10-ARK-RBT-C2	Nickel	N	2.3	Y	200.26	0.50	N	200.05	1.40	J
2023-10-ARK-RBT-C2	Silver	N	0.497	N	200.26	0.50	N	200.05	0.50	U
2023-10-ARK-RBT-C2	Barium	N	6.53	Y	200.26	0.50	N	200.05	3.52	J
2023-10-ARK-RBT-C2	Antimony	N	0.497	N	200.26	0.50	N	200.05	0.50	U
2023-10-ARK-RBT-C2	Arsenic	N	0.902	Y	200.26	0.91	Y	200.05	0.90	
2023-10-ARK-RBT-C2	Thallium	N	0.994	N	200.26	1.00	N	200.05	1.00	U
2023-10-ARK-RBT-C2	Magnesium	N	1140	Y	200.26	1,090.00	Y	200.05	1,115.01	
2023-10-ARK-RBT-C2	Copper	N	3.99	Y	200.26	1.20	Y	200.05	2.60	
2023-10-ARK-RBT-C2	Vanadium	N	1.99	N	200.26	2.00	N	200.05	1.99	U
2023-10-ARK-RBT-C2	Sodium	N	4920	Y	200.26	2,530.00	Y	200.05	3,725.63	
2023-10-ARK-RBT-C2	Calcium	N	20300	Y	200.26	602.00	Y	200.05	10,456.17	
2023-10-ARK-RBT-C2	Chromium	N	5.03	Y	200.26	4.98	Y	200.05	5.01	

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
2023-10-ARK-RBT-C2	Selenium	N	11.5	Y	200.26	11.50	Y	200.05	11.50	
2023-10-ARK-RBT-C2	Potassium	N	9110	Y	200.26	17,500.00	Y	200.05	13,302.80	
2023-10-ARK-RBT-C3	Mercury	N	0.05	N	150.00	0.07	Y	979.01	0.06	J
2023-10-ARK-RBT-C3	Beryllium	N	2	N	150.00	2.00	N	979.01	2.00	U
2023-10-ARK-RBT-C3	Manganese	N	65.6	Y	150.00	7.50	N	979.01	15.22	J
2023-10-ARK-RBT-C3	Zinc	N	162	Y	150.00	30.00	N	979.01	47.54	J
2023-10-ARK-RBT-C3	Aluminum	N	49.3	N	150.00	50.00	N	979.01	49.91	U
2023-10-ARK-RBT-C3	Lead	N	0.219	Y	150.00	0.10	N	979.01	0.12	J
2023-10-ARK-RBT-C3	Iron	N	156	Y	150.00	99.90	N	979.01	107.35	J
2023-10-ARK-RBT-C3	Cobalt	N	0.364	Y	150.00	0.10	N	979.01	0.13	J
2023-10-ARK-RBT-C3	Cadmium	N	0.0985	N	150.00	0.10	N	979.01	0.10	U
2023-10-ARK-RBT-C3	Nickel	N	1.91	Y	150.00	0.50	N	979.01	0.69	J
2023-10-ARK-RBT-C3	Silver	N	0.493	N	150.00	0.50	N	979.01	0.50	U
2023-10-ARK-RBT-C3	Barium	N	4.44	Y	150.00	0.50	N	979.01	1.02	J
2023-10-ARK-RBT-C3	Antimony	N	0.493	N	150.00	0.50	N	979.01	0.50	U
2023-10-ARK-RBT-C3	Arsenic	N	0.838	Y	150.00	1.19	Y	979.01	1.14	
2023-10-ARK-RBT-C3	Thallium	N	0.985	N	150.00	1.00	N	979.01	1.00	U
2023-10-ARK-RBT-C3	Magnesium	N	837	Y	150.00	990.00	Y	979.01	969.67	
2023-10-ARK-RBT-C3	Copper	N	7.18	Y	150.00	1.19	Y	979.01	1.99	
2023-10-ARK-RBT-C3	Vanadium	N	1.97	N	150.00	2.00	N	979.01	2.00	U
2023-10-ARK-RBT-C3	Sodium	N	4160	Y	150.00	2,570.00	Y	979.01	2,781.25	
2023-10-ARK-RBT-C3	Calcium	N	12700	Y	150.00	1,000.00	Y	979.01	2,554.46	
2023-10-ARK-RBT-C3	Chromium	N	4.65	Y	150.00	4.85	Y	979.01	4.82	
2023-10-ARK-RBT-C3	Selenium	N	11.8	Y	150.00	11.60	Y	979.01	11.63	
2023-10-ARK-RBT-C3	Potassium	N	7910	Y	150.00	14,900.00	Y	979.01	13,971.31	
2023-9-ARK-LOC-C1	Mercury	N	0.197	Y	449.98	0.30	Y	450.70	0.25	
2023-9-ARK-LOC-C1	Beryllium	N	2	N	449.98	2.00	N	450.70	2.00	U
2023-9-ARK-LOC-C1	Manganese	N	15.2	Y	449.98	7.40	N	450.70	11.30	J
2023-9-ARK-LOC-C1	Zinc	N	548	Y	449.98	30.10	Y	450.70	288.84	
2023-9-ARK-LOC-C1	Aluminum	N	49.4	N	449.98	49.50	N	450.70	49.45	U
2023-9-ARK-LOC-C1	Lead	N	0.198	N	449.98	0.10	N	450.70	0.15	U
2023-9-ARK-LOC-C1	Iron	N	213	Y	449.98	99.00	N	450.70	155.95	J
2023-9-ARK-LOC-C1	Cobalt	N	0.23	Y	449.98	0.10	N	450.70	0.16	J
2023-9-ARK-LOC-C1	Cadmium	N	0.198	N	449.98	0.10	N	450.70	0.15	U
2023-9-ARK-LOC-C1	Nickel	N	4.49	Y	449.98	0.50	N	450.70	2.49	J
2023-9-ARK-LOC-C1	Silver	N	0.988	N	449.98	0.50	N	450.70	0.74	U
2023-9-ARK-LOC-C1	Barium	N	1.38	Y	449.98	0.50	N	450.70	0.94	J
2023-9-ARK-LOC-C1	Antimony	N	0.988	N	449.98	0.50	N	450.70	0.74	U
2023-9-ARK-LOC-C1	Arsenic	N	0.988	N	449.98	0.59	Y	450.70	0.79	J
2023-9-ARK-LOC-C1	Thallium	N	1.98	N	449.98	0.99	N	450.70	1.48	U
2023-9-ARK-LOC-C1	Magnesium	N	1210	Y	449.98	980.00	Y	450.70	1,094.91	
2023-9-ARK-LOC-C1	Copper	N	20.7	Y	449.98	2.48	Y	450.70	11.58	
2023-9-ARK-LOC-C1	Vanadium	N	3.95	N	449.98	1.98	N	450.70	2.96	U
2023-9-ARK-LOC-C1	Sodium	N	5660	Y	449.98	3,690.00	Y	450.70	4,674.22	

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
2023-9-ARK-LOC-C1	Calcium	N	46800	Y	449.98	446.00	Y	450.70	23,604.60	
2023-9-ARK-LOC-C1	Chromium	N	4.72	Y	449.98	6.04	Y	450.70	5.38	
2023-9-ARK-LOC-C1	Selenium	N	12.1	Y	449.98	9.21	Y	450.70	10.65	
2023-9-ARK-LOC-C1	Potassium	N	9050	Y	449.98	15,700.00	Y	450.70	12,377.64	
2023-10-FTN-CAT-C1	Mercury	N	0.05	N	185.03	0.05	N	71.71	0.05	U
2023-10-FTN-CAT-C1	Beryllium	N	2	N	185.03	2.00	N	71.71	2.00	U
2023-10-FTN-CAT-C1	Manganese	N	7.8	Y	185.03	7.50	N	71.71	7.72	J
2023-10-FTN-CAT-C1	Zinc	N	93.3	Y	185.03	34.20	Y	71.71	76.79	
2023-10-FTN-CAT-C1	Aluminum	N	49.4	N	185.03	49.80	N	71.71	49.51	U
2023-10-FTN-CAT-C1	Lead	N	0.209	Y	185.03	0.10	N	71.71	0.18	J
2023-10-FTN-CAT-C1	Iron	N	98.9	N	185.03	99.50	N	71.71	99.07	U
2023-10-FTN-CAT-C1	Cobalt	N	0.264	Y	185.03	0.10	N	71.71	0.22	J
2023-10-FTN-CAT-C1	Cadmium	N	0.198	N	185.03	0.10	N	71.71	0.17	U
2023-10-FTN-CAT-C1	Nickel	N	4.94	Y	185.03	0.50	N	71.71	3.70	J
2023-10-FTN-CAT-C1	Silver	N	0.989	N	185.03	0.50	N	71.71	0.85	U
2023-10-FTN-CAT-C1	Barium	N	2.38	Y	185.03	0.50	N	71.71	1.85	J
2023-10-FTN-CAT-C1	Antimony	N	0.989	N	185.03	0.50	N	71.71	0.85	U
2023-10-FTN-CAT-C1	Arsenic	N	0.989	N	185.03	0.79	Y	71.71	0.93	J
2023-10-FTN-CAT-C1	Thallium	N	1.98	N	185.03	1.00	N	71.71	1.70	U
2023-10-FTN-CAT-C1	Magnesium	N	1250	Y	185.03	1,090.00	Y	71.71	1,205.31	
2023-10-FTN-CAT-C1	Copper	N	1.84	Y	185.03	1.34	Y	71.71	1.70	
2023-10-FTN-CAT-C1	Vanadium	N	3.96	N	185.03	1.99	N	71.71	3.41	U
2023-10-FTN-CAT-C1	Sodium	N	5510	Y	185.03	2,600.00	Y	71.71	4,697.21	
2023-10-FTN-CAT-C1	Calcium	N	47900	Y	185.03	1,500.00	Y	71.71	34,940.02	
2023-10-FTN-CAT-C1	Chromium	N	5.1	Y	185.03	5.30	Y	71.71	5.16	
2023-10-FTN-CAT-C1	Selenium	N	8.13	Y	185.03	14.50	Y	71.71	9.91	
2023-10-FTN-CAT-C1	Potassium	N	8400	Y	185.03	17,800.00	Y	71.71	11,025.51	
2023-10-FTN-CAT-C2	Mercury	N	0.05	N	100.10	0.10	Y	100.06	0.07	J
2023-10-FTN-CAT-C2	Beryllium	N	2	N	100.10	2.00	N	100.06	2.00	U
2023-10-FTN-CAT-C2	Manganese	N	7.5	N	100.10	7.40	N	100.06	7.45	U
2023-10-FTN-CAT-C2	Zinc	N	62.5	Y	100.10	29.80	N	100.06	46.15	J
2023-10-FTN-CAT-C2	Aluminum	N	49.8	N	100.10	49.60	N	100.06	49.70	U
2023-10-FTN-CAT-C2	Lead	N	0.133	Y	100.10	0.10	N	100.06	0.12	J
2023-10-FTN-CAT-C2	Iron	N	99.6	N	100.10	99.30	N	100.06	99.45	U
2023-10-FTN-CAT-C2	Cobalt	N	0.146	Y	100.10	0.10	N	100.06	0.12	J
2023-10-FTN-CAT-C2	Cadmium	N	0.0996	N	100.10	0.10	N	100.06	0.10	U
2023-10-FTN-CAT-C2	Nickel	N	2.69	Y	100.10	0.50	N	100.06	1.59	J
2023-10-FTN-CAT-C2	Silver	N	0.498	N	100.10	0.50	N	100.06	0.50	U
2023-10-FTN-CAT-C2	Barium	N	1.98	Y	100.10	0.50	N	100.06	1.24	J
2023-10-FTN-CAT-C2	Antimony	N	0.498	N	100.10	0.50	N	100.06	0.50	U
2023-10-FTN-CAT-C2	Arsenic	N	0.869	Y	100.10	1.30	Y	100.06	1.08	
2023-10-FTN-CAT-C2	Thallium	N	0.996	N	100.10	0.99	N	100.06	0.99	U
2023-10-FTN-CAT-C2	Magnesium	N	859	Y	100.10	1,010.00	Y	100.06	934.48	
2023-10-FTN-CAT-C2	Copper	N	1.45	Y	100.10	0.95	Y	100.06	1.20	

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
2023-10-FTN-CAT-C2	Vanadium	N	1.99	N	100.10	1.99	N	100.06	1.99	U
2023-10-FTN-CAT-C2	Sodium	N	3900	Y	100.10	2,200.00	Y	100.06	3,050.17	
2023-10-FTN-CAT-C2	Calcium	N	21900	Y	100.10	357.00	Y	100.06	11,130.65	
2023-10-FTN-CAT-C2	Chromium	N	4.94	Y	100.10	6.65	Y	100.06	5.79	
2023-10-FTN-CAT-C2	Selenium	N	6.63	Y	100.10	8.43	Y	100.06	7.53	
2023-10-FTN-CAT-C2	Potassium	N	7720	Y	100.10	18,000.00	Y	100.06	12,858.97	
2023-10-FTN-RBT-C1	Mercury	N	0.05	N	160.42	0.05	N	118.12	0.05	U
2023-10-FTN-RBT-C1	Beryllium	N	2	N	160.42	2.00	N	118.12	2.00	U
2023-10-FTN-RBT-C1	Manganese	N	16.1	Y	160.42	7.50	N	118.12	12.45	J
2023-10-FTN-RBT-C1	Zinc	N	209	Y	160.42	42.40	Y	118.12	138.35	
2023-10-FTN-RBT-C1	Aluminum	N	49.8	N	160.42	49.70	N	118.12	49.76	U
2023-10-FTN-RBT-C1	Lead	N	0.263	Y	160.42	0.20	Y	118.12	0.24	
2023-10-FTN-RBT-C1	Iron	N	99.7	N	160.42	99.40	N	118.12	99.57	U
2023-10-FTN-RBT-C1	Cobalt	N	0.162	Y	160.42	0.10	N	118.12	0.14	J
2023-10-FTN-RBT-C1	Cadmium	N	0.0997	N	160.42	0.10	N	118.12	0.10	U
2023-10-FTN-RBT-C1	Nickel	N	3.56	Y	160.42	0.93	Y	118.12	2.44	
2023-10-FTN-RBT-C1	Silver	N	0.498	N	160.42	0.50	N	118.12	0.50	U
2023-10-FTN-RBT-C1	Barium	N	1.64	Y	160.42	0.50	N	118.12	1.16	J
2023-10-FTN-RBT-C1	Antimony	N	0.498	N	160.42	0.50	N	118.12	0.50	U
2023-10-FTN-RBT-C1	Arsenic	N	0.498	N	160.42	1.36	Y	118.12	0.86	J
2023-10-FTN-RBT-C1	Thallium	N	0.997	N	160.42	0.99	N	118.12	1.00	U
2023-10-FTN-RBT-C1	Magnesium	N	1770	Y	160.42	1,140.00	Y	118.12	1,502.84	
2023-10-FTN-RBT-C1	Copper	N	2.45	Y	160.42	3.01	Y	118.12	2.69	
2023-10-FTN-RBT-C1	Vanadium	N	1.99	N	160.42	1.99	N	118.12	1.99	U
2023-10-FTN-RBT-C1	Sodium	N	4180	Y	160.42	2,460.00	Y	118.12	3,450.60	
2023-10-FTN-RBT-C1	Calcium	N	76700	Y	160.42	8,350.00	Y	118.12	47,714.93	
2023-10-FTN-RBT-C1	Chromium	N	3.4	Y	160.42	5.61	Y	118.12	4.34	
2023-10-FTN-RBT-C1	Selenium	N	0.997	N	160.42	1.14	Y	118.12	1.06	J
2023-10-FTN-RBT-C1	Potassium	N	9390	Y	160.42	17,700.00	Y	118.12	12,914.01	
2023-10-FTN-RBT-C2	Mercury	N	0.05	N	342.56	0.08	Y	199.04	0.06	J
2023-10-FTN-RBT-C2	Beryllium	N	2	N	342.56	2.00	N	199.04	2.00	U
2023-10-FTN-RBT-C2	Manganese	N	7.5	N	342.56	7.50	N	199.04	7.50	U
2023-10-FTN-RBT-C2	Zinc	N	115	Y	342.56	29.90	N	199.04	83.73	J
2023-10-FTN-RBT-C2	Aluminum	N	49.8	N	342.56	49.90	N	199.04	49.84	U
2023-10-FTN-RBT-C2	Lead	N	0.383	Y	342.56	0.15	Y	199.04	0.30	
2023-10-FTN-RBT-C2	Iron	N	99.5	N	342.56	99.80	N	199.04	99.61	U
2023-10-FTN-RBT-C2	Cobalt	N	0.202	Y	342.56	0.10	N	199.04	0.16	J
2023-10-FTN-RBT-C2	Cadmium	N	0.199	N	342.56	0.10	N	199.04	0.16	U
2023-10-FTN-RBT-C2	Nickel	N	4.27	Y	342.56	0.50	N	199.04	2.88	J
2023-10-FTN-RBT-C2	Silver	N	0.995	N	342.56	0.50	N	199.04	0.81	U
2023-10-FTN-RBT-C2	Barium	N	1.8	Y	342.56	0.50	N	199.04	1.32	J
2023-10-FTN-RBT-C2	Antimony	N	0.995	N	342.56	0.50	N	199.04	0.81	U
2023-10-FTN-RBT-C2	Arsenic	N	1.02	Y	342.56	2.11	Y	199.04	1.42	
2023-10-FTN-RBT-C2	Thallium	N	1.99	N	342.56	1.00	N	199.04	1.63	U

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
2023-10-FTN-RBT-C2	Magnesium	N	1250	Y	342.56	1,070.00	Y	199.04	1,183.85	
2023-10-FTN-RBT-C2	Copper	N	3.85	Y	342.56	1.94	Y	199.04	3.15	
2023-10-FTN-RBT-C2	Vanadium	N	3.98	N	342.56	2.00	N	199.04	3.25	U
2023-10-FTN-RBT-C2	Sodium	N	4500	Y	342.56	2,860.00	Y	199.04	3,897.29	
2023-10-FTN-RBT-C2	Calcium	N	47000	Y	342.56	1,840.00	Y	199.04	30,403.53	
2023-10-FTN-RBT-C2	Chromium	N	4.52	Y	342.56	6.00	Y	199.04	5.06	
2023-10-FTN-RBT-C2	Selenium	N	1.99	N	342.56	1.32	Y	199.04	1.74	J
2023-10-FTN-RBT-C2	Potassium	N	9380	Y	342.56	18,500.00	Y	199.04	12,731.63	
2023-10-FTN-RBT-C3	Mercury	N	0.05	N	410.64	0.05	N	229.46	0.05	U
2023-10-FTN-RBT-C3	Beryllium	N	2	N	410.64	2.00	N	229.46	2.00	U
2023-10-FTN-RBT-C3	Manganese	N	7.6	N	410.64	7.50	N	229.46	7.56	U
2023-10-FTN-RBT-C3	Zinc	N	312	Y	410.64	33.60	Y	229.46	212.20	
2023-10-FTN-RBT-C3	Aluminum	N	50.5	N	410.64	49.80	N	229.46	50.25	U
2023-10-FTN-RBT-C3	Lead	N	0.459	Y	410.64	0.10	N	229.46	0.33	J
2023-10-FTN-RBT-C3	Iron	N	122	Y	410.64	99.70	N	229.46	114.01	J
2023-10-FTN-RBT-C3	Cobalt	N	0.153	Y	410.64	0.10	N	229.46	0.13	J
2023-10-FTN-RBT-C3	Cadmium	N	0.122	Y	410.64	0.10	N	229.46	0.11	J
2023-10-FTN-RBT-C3	Nickel	N	3.02	Y	410.64	0.50	N	229.46	2.12	J
2023-10-FTN-RBT-C3	Silver	N	0.505	N	410.64	0.50	N	229.46	0.50	U
2023-10-FTN-RBT-C3	Barium	N	1.5	Y	410.64	0.50	N	229.46	1.14	J
2023-10-FTN-RBT-C3	Antimony	N	0.505	N	410.64	0.50	N	229.46	0.50	U
2023-10-FTN-RBT-C3	Arsenic	N	1.29	Y	410.64	2.79	Y	229.46	1.83	
2023-10-FTN-RBT-C3	Thallium	N	1.01	N	410.64	1.00	N	229.46	1.01	U
2023-10-FTN-RBT-C3	Magnesium	N	1430	Y	410.64	1,320.00	Y	229.46	1,390.57	
2023-10-FTN-RBT-C3	Copper	N	4.06	Y	410.64	1.65	Y	229.46	3.20	
2023-10-FTN-RBT-C3	Vanadium	N	2.02	N	410.64	2.76	Y	229.46	2.29	J
2023-10-FTN-RBT-C3	Sodium	N	4650	Y	410.64	3,390.00	Y	229.46	4,198.32	
2023-10-FTN-RBT-C3	Calcium	N	34400	Y	410.64	1,320.00	Y	229.46	22,541.64	
2023-10-FTN-RBT-C3	Chromium	N	4.71	Y	410.64	6.59	Y	229.46	5.38	
2023-10-FTN-RBT-C3	Selenium	N	1.79	Y	410.64	1.16	Y	229.46	1.56	
2023-10-FTN-RBT-C3	Potassium	N	12800	Y	410.64	21,000.00	Y	229.46	15,739.50	
2023-10-RYN-CAT-C1	Mercury	N	0.05	N	100.40	0.08	Y	100.16	0.06	J
2023-10-RYN-CAT-C1	Beryllium	N	2	N	100.40	2.00	N	100.16	2.00	U
2023-10-RYN-CAT-C1	Manganese	N	12.5	Y	100.40	7.40	N	100.16	9.95	J
2023-10-RYN-CAT-C1	Zinc	N	90.2	Y	100.40	29.60	N	100.16	59.94	J
2023-10-RYN-CAT-C1	Aluminum	N	50.1	N	100.40	49.30	N	100.16	49.70	U
2023-10-RYN-CAT-C1	Lead	N	0.2	N	100.40	0.10	N	100.16	0.15	U
2023-10-RYN-CAT-C1	Iron	N	100	N	100.40	98.60	N	100.16	99.30	U
2023-10-RYN-CAT-C1	Cobalt	N	0.33	Y	100.40	0.10	N	100.16	0.21	J
2023-10-RYN-CAT-C1	Cadmium	N	0.2	N	100.40	0.10	N	100.16	0.15	U
2023-10-RYN-CAT-C1	Nickel	N	6.94	Y	100.40	0.49	N	100.16	3.72	J
2023-10-RYN-CAT-C1	Silver	N	1	N	100.40	0.49	N	100.16	0.75	U
2023-10-RYN-CAT-C1	Barium	N	2.19	Y	100.40	0.49	N	100.16	1.34	J
2023-10-RYN-CAT-C1	Antimony	N	1	N	100.40	0.49	N	100.16	0.75	U

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
2023-10-RYN-CAT-C1	Arsenic	N	1	N	100.40	0.79	Y	100.16	0.90	J
2023-10-RYN-CAT-C1	Thallium	N	2	N	100.40	0.99	N	100.16	1.49	U
2023-10-RYN-CAT-C1	Magnesium	N	1490	Y	100.40	991.00	Y	100.16	1,240.80	
2023-10-RYN-CAT-C1	Copper	N	1.52	Y	100.40	1.15	Y	100.16	1.34	
2023-10-RYN-CAT-C1	Vanadium	N	4.01	N	100.40	1.97	N	100.16	2.99	U
2023-10-RYN-CAT-C1	Sodium	N	4440	Y	100.40	2,220.00	Y	100.16	3,331.33	
2023-10-RYN-CAT-C1	Calcium	N	76000	Y	100.40	351.00	Y	100.16	38,220.76	
2023-10-RYN-CAT-C1	Chromium	N	4.73	Y	100.40	5.39	Y	100.16	5.06	
2023-10-RYN-CAT-C1	Selenium	N	4.05	Y	100.40	6.02	Y	100.16	5.03	
2023-10-RYN-CAT-C1	Potassium	N	7190	Y	100.40	17,000.00	Y	100.16	12,089.13	
2023-10-RYN-CAT-C2	Mercury	N	0.083	Y	224.36	0.22	Y	151.70	0.14	
2023-10-RYN-CAT-C2	Beryllium	N	2	N	224.36	2.00	N	151.70	2.00	U
2023-10-RYN-CAT-C2	Manganese	N	24.8	Y	224.36	12.00	Y	151.70	19.64	
2023-10-RYN-CAT-C2	Zinc	N	63.2	Y	224.36	30.10	N	151.70	49.85	J
2023-10-RYN-CAT-C2	Aluminum	N	49.8	N	224.36	50.20	N	151.70	49.96	U
2023-10-RYN-CAT-C2	Lead	N	0.221	Y	224.36	0.10	N	151.70	0.17	J
2023-10-RYN-CAT-C2	Iron	N	99.5	N	224.36	100.00	N	151.70	99.70	U
2023-10-RYN-CAT-C2	Cobalt	N	0.2	Y	224.36	0.10	N	151.70	0.16	J
2023-10-RYN-CAT-C2	Cadmium	N	0.0995	N	224.36	0.10	N	151.70	0.10	U
2023-10-RYN-CAT-C2	Nickel	N	3.05	Y	224.36	0.77	Y	151.70	2.13	
2023-10-RYN-CAT-C2	Silver	N	0.498	N	224.36	0.50	N	151.70	0.50	U
2023-10-RYN-CAT-C2	Barium	N	1.39	Y	224.36	0.50	N	151.70	1.03	J
2023-10-RYN-CAT-C2	Antimony	N	0.498	N	224.36	0.50	N	151.70	0.50	U
2023-10-RYN-CAT-C2	Arsenic	N	0.962	Y	224.36	0.85	Y	151.70	0.92	
2023-10-RYN-CAT-C2	Thallium	N	0.995	N	224.36	1.00	N	151.70	1.00	U
2023-10-RYN-CAT-C2	Magnesium	N	935	Y	224.36	1,000.00	Y	151.70	961.22	
2023-10-RYN-CAT-C2	Copper	N	1.54	Y	224.36	1.22	Y	151.70	1.41	
2023-10-RYN-CAT-C2	Vanadium	N	1.99	N	224.36	2.01	N	151.70	2.00	U
2023-10-RYN-CAT-C2	Sodium	N	4260	Y	224.36	2,570.00	Y	151.70	3,578.27	
2023-10-RYN-CAT-C2	Calcium	N	31000	Y	224.36	8,550.00	Y	151.70	21,943.83	
2023-10-RYN-CAT-C2	Chromium	N	5.43	Y	224.36	4.84	Y	151.70	5.19	
2023-10-RYN-CAT-C2	Selenium	N	3.89	Y	224.36	3.97	Y	151.70	3.92	
2023-10-RYN-CAT-C2	Potassium	N	7630	Y	224.36	14,800.00	Y	151.70	10,522.33	
2023-10-RYN-CAT-C3	Mercury	N	0.049	N	300.70	0.12	Y	300.28	0.09	J
2023-10-RYN-CAT-C3	Beryllium	N	2	N	300.70	2.00	N	300.28	2.00	U
2023-10-RYN-CAT-C3	Manganese	N	14.5	Y	300.70	7.50	N	300.28	11.00	J
2023-10-RYN-CAT-C3	Zinc	N	47.4	Y	300.70	30.00	N	300.28	38.71	J
2023-10-RYN-CAT-C3	Aluminum	N	49.6	N	300.70	50.00	N	300.28	49.80	U
2023-10-RYN-CAT-C3	Lead	N	0.236	Y	300.70	0.10	N	300.28	0.17	J
2023-10-RYN-CAT-C3	Iron	N	99.1	N	300.70	100.00	N	300.28	99.55	U
2023-10-RYN-CAT-C3	Cobalt	N	0.176	Y	300.70	0.10	N	300.28	0.14	J
2023-10-RYN-CAT-C3	Cadmium	N	0.101	N	300.70	0.10	N	300.28	0.10	U
2023-10-RYN-CAT-C3	Nickel	N	2.79	Y	300.70	0.50	N	300.28	1.65	J
2023-10-RYN-CAT-C3	Silver	N	0.503	N	300.70	0.50	N	300.28	0.50	U

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
2023-10-RYN-CAT-C3	Barium	N	0.93	Y	300.70	0.50	N	300.28	0.72	J
2023-10-RYN-CAT-C3	Antimony	N	0.503	N	300.70	0.50	N	300.28	0.50	U
2023-10-RYN-CAT-C3	Arsenic	N	0.557	Y	300.70	1.16	Y	300.28	0.86	
2023-10-RYN-CAT-C3	Thallium	N	1.01	N	300.70	1.00	N	300.28	1.01	U
2023-10-RYN-CAT-C3	Magnesium	N	736	Y	300.70	887.00	Y	300.28	811.45	
2023-10-RYN-CAT-C3	Copper	N	1.09	Y	300.70	1.03	Y	300.28	1.06	
2023-10-RYN-CAT-C3	Vanadium	N	2.01	N	300.70	2.00	N	300.28	2.01	U
2023-10-RYN-CAT-C3	Sodium	N	3150	Y	300.70	2,070.00	Y	300.28	2,610.38	
2023-10-RYN-CAT-C3	Calcium	N	25400	Y	300.70	335.00	Y	300.28	12,876.26	
2023-10-RYN-CAT-C3	Chromium	N	4.7	Y	300.70	4.72	Y	300.28	4.71	
2023-10-RYN-CAT-C3	Selenium	N	2.43	Y	300.70	4.80	Y	300.28	3.61	
2023-10-RYN-CAT-C3	Potassium	N	5760	Y	300.70	15,200.00	Y	300.28	10,476.70	
RYN-WAL-C1	Mercury	N	0.06	Y	240.03	0.14	Y	239.98	0.10	
RYN-WAL-C1	Beryllium	N	5	N	240.03	5.10	N	239.98	5.05	U
RYN-WAL-C1	Manganese	N	15.1	N	240.03	15.30	N	239.98	15.20	U
RYN-WAL-C1	Zinc	N	40.4	Y	240.03	30.60	N	239.98	35.50	J
RYN-WAL-C1	Aluminum	N	100	N	240.03	102.00	N	239.98	101.00	U
RYN-WAL-C1	Lead	N	0.103	Y	240.03	0.20	N	239.98	0.15	J
RYN-WAL-C1	Iron	N	251	N	240.03	255.00	N	239.98	253.00	U
RYN-WAL-C1	Cobalt	N	0.227	Y	240.03	0.20	N	239.98	0.22	J
RYN-WAL-C1	Cadmium	N	0.201	N	240.03	0.20	N	239.98	0.20	U
RYN-WAL-C1	Nickel	N	3.76	Y	240.03	1.02	N	239.98	2.39	J
RYN-WAL-C1	Silver	N	1	N	240.03	1.02	N	239.98	1.01	U
RYN-WAL-C1	Barium	N	10	N	240.03	10.20	N	239.98	10.10	U
RYN-WAL-C1	Antimony	N	1	N	240.03	1.02	N	239.98	1.01	U
RYN-WAL-C1	Arsenic	N	2.01	N	240.03	1.30	Y	239.98	1.66	J
RYN-WAL-C1	Thallium	N	2.01	N	240.03	2.04	N	239.98	2.02	U
RYN-WAL-C1	Magnesium	N	1040	Y	240.03	1,050.00	Y	239.98	1,045.00	
RYN-WAL-C1	Copper	N	0.939	Y	240.03	1.00	Y	239.98	0.97	
RYN-WAL-C1	Vanadium	N	3.01	N	240.03	3.06	N	239.98	3.03	U
RYN-WAL-C1	Sodium	N	2870	Y	240.03	1,850.00	Y	239.98	2,360.05	
RYN-WAL-C1	Calcium	N	41600	Y	240.03	879.00	Y	239.98	21,241.62	
RYN-WAL-C1	Chromium	N	3.6	Y	240.03	4.04	Y	239.98	3.82	
RYN-WAL-C1	Selenium	N	8.67	Y	240.03	19.00	Y	239.98	13.83	
RYN-WAL-C1	Potassium	N	6820	Y	240.03	16,300.00	Y	239.98	11,559.51	
RYN-SAU-C3	Mercury	N	0.091	Y	319.73	0.33	Y	319.92	0.21	
RYN-SAU-C3	Beryllium	N	5	N	319.73	5.00	N	319.92	5.00	U
RYN-SAU-C3	Manganese	N	14.9	N	319.73	15.10	N	319.92	15.00	U
RYN-SAU-C3	Zinc	N	48	Y	319.73	30.20	N	319.92	39.10	J
RYN-SAU-C3	Aluminum	N	99.3	N	319.73	101.00	N	319.92	100.15	U
RYN-SAU-C3	Lead	N	0.199	N	319.73	0.20	N	319.92	0.20	U
RYN-SAU-C3	Iron	N	248	N	319.73	251.00	N	319.92	249.50	U
RYN-SAU-C3	Cobalt	N	0.106	Y	319.73	0.20	N	319.92	0.15	J
RYN-SAU-C3	Cadmium	N	0.199	N	319.73	0.20	N	319.92	0.20	U

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
RYN-SAU-C3	Nickel	N	1.65	Y	319.73	1.19	Y	319.92	1.42	
RYN-SAU-C3	Silver	N	0.993	N	319.73	1.01	N	319.92	1.00	U
RYN-SAU-C3	Barium	N	9.93	N	319.73	10.10	N	319.92	10.02	U
RYN-SAU-C3	Antimony	N	0.993	N	319.73	1.01	N	319.92	1.00	U
RYN-SAU-C3	Arsenic	N	1.99	N	319.73	2.02	Y	319.92	2.01	J
RYN-SAU-C3	Thallium	N	1.99	N	319.73	2.01	N	319.92	2.00	U
RYN-SAU-C3	Magnesium	N	805	Y	319.73	1,300.00	Y	319.92	1,052.57	
RYN-SAU-C3	Copper	N	1.58	Y	319.73	0.72	Y	319.92	1.15	
RYN-SAU-C3	Vanadium	N	2.98	N	319.73	3.02	N	319.92	3.00	U
RYN-SAU-C3	Sodium	N	2740	Y	319.73	1,870.00	Y	319.92	2,304.87	
RYN-SAU-C3	Calcium	N	26600	Y	319.73	19,300.00	Y	319.92	22,948.93	
RYN-SAU-C3	Chromium	N	3.09	Y	319.73	3.94	Y	319.92	3.52	
RYN-SAU-C3	Selenium	N	7.28	Y	319.73	12.50	Y	319.92	9.89	
RYN-SAU-C3	Potassium	N	6280	Y	319.73	15,000.00	Y	319.92	10,641.27	
RYN-SAU-C1	Mercury	N	0.077	Y	319.73	0.07	Y	319.92	0.07	
RYN-SAU-C1	Beryllium	N	5	N	319.73	4.90	N	319.92	4.95	U
RYN-SAU-C1	Manganese	N	14.9	N	319.73	14.70	N	319.92	14.80	U
RYN-SAU-C1	Zinc	N	46.6	Y	319.73	29.40	N	319.92	38.00	J
RYN-SAU-C1	Aluminum	N	99.6	N	319.73	98.00	N	319.92	98.80	U
RYN-SAU-C1	Lead	N	0.199	N	319.73	0.20	N	319.92	0.20	U
RYN-SAU-C1	Iron	N	249	N	319.73	245.00	N	319.92	247.00	U
RYN-SAU-C1	Cobalt	N	0.109	Y	319.73	0.20	N	319.92	0.15	J
RYN-SAU-C1	Cadmium	N	0.199	N	319.73	0.20	N	319.92	0.20	U
RYN-SAU-C1	Nickel	N	1.99	Y	319.73	0.98	N	319.92	1.48	J
RYN-SAU-C1	Silver	N	0.996	N	319.73	0.98	N	319.92	0.99	U
RYN-SAU-C1	Barium	N	9.96	N	319.73	9.80	N	319.92	9.88	U
RYN-SAU-C1	Antimony	N	0.996	N	319.73	0.98	N	319.92	0.99	U
RYN-SAU-C1	Arsenic	N	1.23	Y	319.73	1.10	Y	319.92	1.16	
RYN-SAU-C1	Thallium	N	1.99	N	319.73	1.96	N	319.92	1.97	U
RYN-SAU-C1	Magnesium	N	856	Y	319.73	1,140.00	Y	319.92	998.04	
RYN-SAU-C1	Copper	N	0.988	Y	319.73	0.76	Y	319.92	0.87	
RYN-SAU-C1	Vanadium	N	2.99	N	319.73	2.94	N	319.92	2.96	U
RYN-SAU-C1	Sodium	N	2660	Y	319.73	1,990.00	Y	319.92	2,324.90	
RYN-SAU-C1	Calcium	N	30900	Y	319.73	1,680.00	Y	319.92	16,285.74	
RYN-SAU-C1	Chromium	N	3.04	Y	319.73	6.42	Y	319.92	4.73	
RYN-SAU-C1	Selenium	N	8.11	Y	319.73	25.30	Y	319.92	16.71	
RYN-SAU-C1	Potassium	N	5840	Y	319.73	17,300.00	Y	319.92	11,571.67	
RYN-SAU-C2	Mercury	N	0.1	N	319.73	0.26	Y	319.92	0.18	J
RYN-SAU-C2	Beryllium	N	5	N	319.73	4.90	N	319.92	4.95	U
RYN-SAU-C2	Manganese	N	15.1	N	319.73	14.60	N	319.92	14.85	U
RYN-SAU-C2	Zinc	N	52.4	Y	319.73	29.30	N	319.92	40.85	J
RYN-SAU-C2	Aluminum	N	101	N	319.73	97.60	N	319.92	99.30	U
RYN-SAU-C2	Lead	N	0.201	N	319.73	0.20	N	319.92	0.20	U
RYN-SAU-C2	Iron	N	252	N	319.73	244.00	N	319.92	248.00	U

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
RYN-SAU-C2	Cobalt	N	0.123	Y	319.73	0.20	N	319.92	0.16	J
RYN-SAU-C2	Cadmium	N	0.201	N	319.73	0.20	N	319.92	0.20	U
RYN-SAU-C2	Nickel	N	2.32	Y	319.73	0.98	N	319.92	1.65	J
RYN-SAU-C2	Silver	N	1.01	N	319.73	0.98	N	319.92	0.99	U
RYN-SAU-C2	Barium	N	10.1	N	319.73	9.76	N	319.92	9.93	U
RYN-SAU-C2	Antimony	N	1.01	N	319.73	0.98	N	319.92	0.99	U
RYN-SAU-C2	Arsenic	N	2.01	N	319.73	2.14	Y	319.92	2.08	J
RYN-SAU-C2	Thallium	N	2.01	N	319.73	1.95	N	319.92	1.98	U
RYN-SAU-C2	Magnesium	N	944	Y	319.73	1,180.00	Y	319.92	1,062.03	
RYN-SAU-C2	Copper	N	1.09	Y	319.73	0.70	Y	319.92	0.90	
RYN-SAU-C2	Vanadium	N	3.02	N	319.73	2.93	N	319.92	2.97	U
RYN-SAU-C2	Sodium	N	3000	Y	319.73	1,680.00	Y	319.92	2,339.81	
RYN-SAU-C2	Calcium	N	36900	Y	319.73	5,810.00	Y	319.92	21,350.46	
RYN-SAU-C2	Chromium	N	3.51	Y	319.73	4.29	Y	319.92	3.90	
RYN-SAU-C2	Selenium	N	12.5	Y	319.73	16.60	Y	319.92	14.55	
RYN-SAU-C2	Potassium	N	6910	Y	319.73	16,500.00	Y	319.92	11,706.40	
RYN-RBT-C3	Mercury	N	0.1	N	302.55	0.05	Y	319.43	0.08	J
RYN-RBT-C3	Beryllium	N	5	N	302.55	5.00	N	319.43	5.00	U
RYN-RBT-C3	Manganese	N	8.1	Y	302.55	14.90	N	319.43	11.59	J
RYN-RBT-C3	Zinc	N	153	Y	302.55	29.80	N	319.43	89.73	J
RYN-RBT-C3	Aluminum	N	99.7	N	302.55	99.30	N	319.43	99.49	U
RYN-RBT-C3	Lead	N	0.127	Y	302.55	0.20	N	319.43	0.16	J
RYN-RBT-C3	Iron	N	249	N	302.55	248.00	N	319.43	248.49	U
RYN-RBT-C3	Cobalt	N	0.21	Y	302.55	0.20	N	319.43	0.20	J
RYN-RBT-C3	Cadmium	N	0.199	N	302.55	0.20	N	319.43	0.20	U
RYN-RBT-C3	Nickel	N	3.51	Y	302.55	0.99	N	319.43	2.22	J
RYN-RBT-C3	Silver	N	0.997	N	302.55	0.99	N	319.43	0.99	U
RYN-RBT-C3	Barium	N	9.97	N	302.55	9.93	N	319.43	9.95	U
RYN-RBT-C3	Antimony	N	0.997	N	302.55	0.99	N	319.43	0.99	U
RYN-RBT-C3	Arsenic	N	1.99	N	302.55	1.13	Y	319.43	1.55	J
RYN-RBT-C3	Thallium	N	1.99	N	302.55	1.99	N	319.43	1.99	U
RYN-RBT-C3	Magnesium	N	1280	Y	302.55	1,210.00	Y	319.43	1,244.05	
RYN-RBT-C3	Copper	N	3.69	Y	302.55	1.37	Y	319.43	2.50	
RYN-RBT-C3	Vanadium	N	2.99	N	302.55	2.98	N	319.43	2.98	U
RYN-RBT-C3	Sodium	N	4160	Y	302.55	2,480.00	Y	319.43	3,297.20	
RYN-RBT-C3	Calcium	N	49300	Y	302.55	1,670.00	Y	319.43	24,838.69	
RYN-RBT-C3	Chromium	N	7.67	Y	302.55	4.48	Y	319.43	6.03	
RYN-RBT-C3	Selenium	N	9.03	Y	302.55	7.95	Y	319.43	8.48	
RYN-RBT-C3	Potassium	N	9620	Y	302.55	20,200.00	Y	319.43	15,053.56	
RYN-RBT-C2	Mercury	N	0.1	N	302.55	0.08	Y	319.43	0.09	J
RYN-RBT-C2	Beryllium	N	5	N	302.55	5.00	N	319.43	5.00	U
RYN-RBT-C2	Manganese	N	15	N	302.55	15.10	N	319.43	15.05	U
RYN-RBT-C2	Zinc	N	168	Y	302.55	30.20	N	319.43	97.23	J
RYN-RBT-C2	Aluminum	N	100	N	302.55	101.00	N	319.43	100.51	U

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
RYN-RBT-C2	Lead	N	0.165	Y	302.55	0.20	N	319.43	0.18	J
RYN-RBT-C2	Iron	N	250	N	302.55	252.00	N	319.43	251.03	U
RYN-RBT-C2	Cobalt	N	0.162	Y	302.55	0.20	N	319.43	0.18	J
RYN-RBT-C2	Cadmium	N	0.2	N	302.55	0.20	N	319.43	0.20	U
RYN-RBT-C2	Nickel	N	2.31	Y	302.55	1.01	N	319.43	1.64	J
RYN-RBT-C2	Silver	N	1	N	302.55	1.01	N	319.43	1.01	U
RYN-RBT-C2	Barium	N	10	N	302.55	10.10	N	319.43	10.05	U
RYN-RBT-C2	Antimony	N	1	N	302.55	1.01	N	319.43	1.01	U
RYN-RBT-C2	Arsenic	N	2	N	302.55	1.13	Y	319.43	1.55	J
RYN-RBT-C2	Thallium	N	2	N	302.55	2.01	N	319.43	2.01	U
RYN-RBT-C2	Magnesium	N	1280	Y	302.55	1,210.00	Y	319.43	1,244.05	
RYN-RBT-C2	Copper	N	4.05	Y	302.55	1.34	Y	319.43	2.66	
RYN-RBT-C2	Vanadium	N	3	N	302.55	3.02	N	319.43	3.01	U
RYN-RBT-C2	Sodium	N	4260	Y	302.55	2,340.00	Y	319.43	3,273.95	
RYN-RBT-C2	Calcium	N	32700	Y	302.55	934.00	Y	319.43	16,385.96	
RYN-RBT-C2	Chromium	N	4.25	Y	302.55	4.49	Y	319.43	4.37	
RYN-RBT-C2	Selenium	N	7.53	Y	302.55	6.24	Y	319.43	6.87	
RYN-RBT-C2	Potassium	N	12200	Y	302.55	20,700.00	Y	319.43	16,565.34	
RYN-RBT-C1	Mercury	N	0.068	Y	302.55	0.08	Y	319.43	0.08	
RYN-RBT-C1	Beryllium	N	5	N	302.55	4.90	N	319.43	4.95	U
RYN-RBT-C1	Manganese	N	15.1	N	302.55	14.80	N	319.43	14.95	U
RYN-RBT-C1	Zinc	N	210	Y	302.55	50.20	Y	319.43	127.93	
RYN-RBT-C1	Aluminum	N	101	N	302.55	98.50	N	319.43	99.72	U
RYN-RBT-C1	Lead	N	0.337	Y	302.55	0.52	Y	319.43	0.43	
RYN-RBT-C1	Iron	N	252	N	302.55	246.00	N	319.43	248.92	U
RYN-RBT-C1	Cobalt	N	0.179	Y	302.55	0.20	N	319.43	0.19	J
RYN-RBT-C1	Cadmium	N	0.101	Y	302.55	0.20	N	319.43	0.15	J
RYN-RBT-C1	Nickel	N	2.49	Y	302.55	0.99	N	319.43	1.72	J
RYN-RBT-C1	Silver	N	1.01	N	302.55	0.99	N	319.43	1.00	U
RYN-RBT-C1	Barium	N	10.1	N	302.55	9.85	N	319.43	9.97	U
RYN-RBT-C1	Antimony	N	1.01	N	302.55	0.99	N	319.43	1.00	U
RYN-RBT-C1	Arsenic	N	1.33	Y	302.55	1.79	Y	319.43	1.57	
RYN-RBT-C1	Thallium	N	2.01	N	302.55	1.97	N	319.43	1.99	U
RYN-RBT-C1	Magnesium	N	1250	Y	302.55	1,260.00	Y	319.43	1,255.14	
RYN-RBT-C1	Copper	N	5.56	Y	302.55	1.86	Y	319.43	3.66	
RYN-RBT-C1	Vanadium	N	3.02	N	302.55	2.96	N	319.43	2.99	U
RYN-RBT-C1	Sodium	N	4620	Y	302.55	2,630.00	Y	319.43	3,598.00	
RYN-RBT-C1	Calcium	N	33700	Y	302.55	2,420.00	Y	319.43	17,635.55	
RYN-RBT-C1	Chromium	N	5.43	Y	302.55	4.56	Y	319.43	4.98	
RYN-RBT-C1	Selenium	N	8.01	Y	302.55	7.13	Y	319.43	7.56	
RYN-RBT-C1	Potassium	N	12400	Y	302.55	20,600.00	Y	319.43	16,611.27	
2022-11-ARK-LOC-C1	Mercury	N	0.051	Y	449.98	0.10	Y	450.70	0.08	
2022-11-ARK-LOC-C1	Beryllium	N	2	N	449.98	2.00	N	450.70	2.00	U
2022-11-ARK-LOC-C1	Manganese	N	12.2	Y	449.98	7.30	N	450.70	9.75	J

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
2022-11-ARK-LOC-C1	Zinc	N	161	Y	449.98	29.30	N	450.70	95.10	J
2022-11-ARK-LOC-C1	Aluminum	N	48.8	N	449.98	48.90	N	450.70	48.85	U
2022-11-ARK-LOC-C1	Lead	N	0.0977	N	449.98	0.10	N	450.70	0.10	U
2022-11-ARK-LOC-C1	Iron	N	97.7	N	449.98	97.70	N	450.70	97.70	U
2022-11-ARK-LOC-C1	Cobalt	N	0.178	Y	449.98	0.10	N	450.70	0.14	J
2022-11-ARK-LOC-C1	Cadmium	N	0.0977	N	449.98	0.10	N	450.70	0.10	U
2022-11-ARK-LOC-C1	Nickel	N	1.31	Y	449.98	0.49	N	450.70	0.90	J
2022-11-ARK-LOC-C1	Silver	N	0.488	N	449.98	0.49	N	450.70	0.49	U
2022-11-ARK-LOC-C1	Barium	N	4.88	N	449.98	4.89	N	450.70	4.89	U
2022-11-ARK-LOC-C1	Antimony	N	0.488	N	449.98	0.49	N	450.70	0.49	U
2022-11-ARK-LOC-C1	Arsenic	N	0.977	N	449.98	0.98	N	450.70	0.98	U
2022-11-ARK-LOC-C1	Thallium	N	0.977	N	449.98	0.98	N	450.70	0.98	U
2022-11-ARK-LOC-C1	Magnesium	N	792	Y	449.98	1,140.00	Y	450.70	966.14	
2022-11-ARK-LOC-C1	Copper	N	19.4	Y	449.98	3.08	Y	450.70	11.23	
2022-11-ARK-LOC-C1	Vanadium	N	1.95	N	449.98	1.95	N	450.70	1.95	U
2022-11-ARK-LOC-C1	Sodium	N	3470	Y	449.98	2,310.00	Y	450.70	2,889.54	
2022-11-ARK-LOC-C1	Calcium	N	10200	Y	449.98	1,800.00	Y	450.70	5,996.67	
2022-11-ARK-LOC-C1	Chromium	N	5.85	Y	449.98	4.99	Y	450.70	5.42	
2022-11-ARK-LOC-C1	Selenium	N	14.8	Y	449.98	12.30	Y	450.70	13.55	
2022-11-ARK-LOC-C1	Potassium	N	9500	Y	449.98	18,400.00	Y	450.70	13,953.53	
2022-11-ARK-LOC-C2	Mercury	N	0.097	Y	299.97	0.14	Y	300.15	0.12	
2022-11-ARK-LOC-C2	Beryllium	N	2	N	299.97	2.00	N	300.15	2.00	U
2022-11-ARK-LOC-C2	Manganese	N	11.1	Y	299.97	7.50	N	300.15	9.30	J
2022-11-ARK-LOC-C2	Zinc	N	138	Y	299.97	30.10	N	300.15	84.03	J
2022-11-ARK-LOC-C2	Aluminum	N	49.3	N	299.97	50.10	N	300.15	49.70	U
2022-11-ARK-LOC-C2	Lead	N	0.0985	N	299.97	0.10	N	300.15	0.10	U
2022-11-ARK-LOC-C2	Iron	N	98.5	N	299.97	100.00	N	300.15	99.25	U
2022-11-ARK-LOC-C2	Cobalt	N	0.185	Y	299.97	0.10	N	300.15	0.14	J
2022-11-ARK-LOC-C2	Cadmium	N	0.0985	N	299.97	0.10	N	300.15	0.10	U
2022-11-ARK-LOC-C2	Nickel	N	1.42	Y	299.97	0.50	N	300.15	0.96	J
2022-11-ARK-LOC-C2	Silver	N	0.493	N	299.97	0.50	N	300.15	0.50	U
2022-11-ARK-LOC-C2	Barium	N	4.93	N	299.97	5.01	N	300.15	4.97	U
2022-11-ARK-LOC-C2	Antimony	N	0.493	N	299.97	0.58	Y	300.15	0.54	J
2022-11-ARK-LOC-C2	Arsenic	N	0.985	N	299.97	1.00	N	300.15	0.99	U
2022-11-ARK-LOC-C2	Thallium	N	0.985	N	299.97	1.00	N	300.15	0.99	U
2022-11-ARK-LOC-C2	Magnesium	N	792	Y	299.97	1,050.00	Y	300.15	921.04	
2022-11-ARK-LOC-C2	Copper	N	17.7	Y	299.97	3.34	Y	300.15	10.52	
2022-11-ARK-LOC-C2	Vanadium	N	1.97	N	299.97	2.00	N	300.15	1.99	U
2022-11-ARK-LOC-C2	Sodium	N	3960	Y	299.97	2,500.00	Y	300.15	3,229.78	
2022-11-ARK-LOC-C2	Calcium	N	13700	Y	299.97	1,050.00	Y	300.15	7,373.10	
2022-11-ARK-LOC-C2	Chromium	N	4.92	Y	299.97	4.30	Y	300.15	4.61	
2022-11-ARK-LOC-C2	Selenium	N	12.3	Y	299.97	11.20	Y	300.15	11.75	
2022-11-ARK-LOC-C2	Potassium	N	9760	Y	299.97	17,100.00	Y	300.15	13,431.10	
2022-11-ARK-LOC-C3	Mercury	N	0.098	Y	599.99	0.16	Y	601.24	0.13	

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
2022-11-ARK-LOC-C3	Beryllium	N	2	N	599.99	2.00	N	601.24	2.00	U
2022-11-ARK-LOC-C3	Manganese	N	13.1	Y	599.99	7.40	N	601.24	10.25	J
2022-11-ARK-LOC-C3	Zinc	N	147	Y	599.99	29.80	N	601.24	88.34	J
2022-11-ARK-LOC-C3	Aluminum	N	49.1	N	599.99	49.60	N	601.24	49.35	U
2022-11-ARK-LOC-C3	Lead	N	0.0983	N	599.99	0.10	N	601.24	0.10	U
2022-11-ARK-LOC-C3	Iron	N	98.3	N	599.99	99.20	N	601.24	98.75	U
2022-11-ARK-LOC-C3	Cobalt	N	0.191	Y	599.99	0.10	N	601.24	0.15	J
2022-11-ARK-LOC-C3	Cadmium	N	0.0983	N	599.99	0.10	N	601.24	0.10	U
2022-11-ARK-LOC-C3	Nickel	N	1.75	Y	599.99	0.50	N	601.24	1.12	J
2022-11-ARK-LOC-C3	Silver	N	0.491	N	599.99	0.50	N	601.24	0.49	U
2022-11-ARK-LOC-C3	Barium	N	4.91	N	599.99	4.96	N	601.24	4.94	U
2022-11-ARK-LOC-C3	Antimony	N	0.491	N	599.99	0.50	N	601.24	0.49	U
2022-11-ARK-LOC-C3	Arsenic	N	0.983	N	599.99	0.99	N	601.24	0.99	U
2022-11-ARK-LOC-C3	Thallium	N	0.983	N	599.99	0.99	N	601.24	0.99	U
2022-11-ARK-LOC-C3	Magnesium	N	765	Y	599.99	1,070.00	Y	601.24	917.66	
2022-11-ARK-LOC-C3	Copper	N	18	Y	599.99	3.24	Y	601.24	10.61	
2022-11-ARK-LOC-C3	Vanadium	N	1.97	N	599.99	1.98	N	601.24	1.98	U
2022-11-ARK-LOC-C3	Sodium	N	4190	Y	599.99	2,820.00	Y	601.24	3,504.29	
2022-11-ARK-LOC-C3	Calcium	N	18600	Y	599.99	338.00	Y	601.24	9,459.50	
2022-11-ARK-LOC-C3	Chromium	N	4.63	Y	599.99	4.88	Y	601.24	4.76	
2022-11-ARK-LOC-C3	Selenium	N	12.4	Y	599.99	10.90	Y	601.24	11.65	
2022-11-ARK-LOC-C3	Potassium	N	9240	Y	599.99	19,500.00	Y	601.24	14,375.34	
2022-11-ARK-LOC-C3	Mercury	FD	0.069	Y	599.99	0.20	Y	601.24	0.13	
2022-11-ARK-LOC-C3	Beryllium	FD	2	N	599.99	2.00	N	601.24	2.00	U
2022-11-ARK-LOC-C3	Manganese	FD	12.2	Y	599.99	7.50	N	601.24	9.85	J
2022-11-ARK-LOC-C3	Zinc	FD	157	Y	599.99	30.00	N	601.24	93.43	J
2022-11-ARK-LOC-C3	Aluminum	FD	49.3	N	599.99	49.90	N	601.24	49.60	U
2022-11-ARK-LOC-C3	Lead	FD	0.0986	N	599.99	0.10	N	601.24	0.10	U
2022-11-ARK-LOC-C3	Iron	FD	98.6	N	599.99	99.90	N	601.24	99.25	U
2022-11-ARK-LOC-C3	Cobalt	FD	0.202	Y	599.99	0.10	N	601.24	0.15	J
2022-11-ARK-LOC-C3	Cadmium	FD	0.0986	N	599.99	0.10	N	601.24	0.10	U
2022-11-ARK-LOC-C3	Nickel	FD	1.69	Y	599.99	0.50	N	601.24	1.09	J
2022-11-ARK-LOC-C3	Silver	FD	0.493	N	599.99	0.50	N	601.24	0.50	U
2022-11-ARK-LOC-C3	Barium	FD	4.93	N	599.99	4.99	N	601.24	4.96	U
2022-11-ARK-LOC-C3	Antimony	FD	0.493	N	599.99	0.50	N	601.24	0.50	U
2022-11-ARK-LOC-C3	Arsenic	FD	0.986	N	599.99	1.00	N	601.24	0.99	U
2022-11-ARK-LOC-C3	Thallium	FD	0.986	N	599.99	1.00	N	601.24	0.99	U
2022-11-ARK-LOC-C3	Magnesium	FD	785	Y	599.99	968.00	Y	601.24	876.60	
2022-11-ARK-LOC-C3	Copper	FD	21.2	Y	599.99	3.43	Y	601.24	12.31	
2022-11-ARK-LOC-C3	Vanadium	FD	1.97	N	599.99	2.00	N	601.24	1.99	U
2022-11-ARK-LOC-C3	Sodium	FD	4420	Y	599.99	2,570.00	Y	601.24	3,494.04	
2022-11-ARK-LOC-C3	Calcium	FD	16300	Y	599.99	1,010.00	Y	601.24	8,647.04	
2022-11-ARK-LOC-C3	Chromium	FD	4.95	Y	599.99	4.87	Y	601.24	4.91	
2022-11-ARK-LOC-C3	Selenium	FD	12.9	Y	599.99	11.00	Y	601.24	11.95	

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
2022-11-ARK-LOC-C3	Potassium	FD	9920	Y	599.99	17,100.00	Y	601.24	13,513.74	
2022-11-ARK-RBT-C1	Mercury	N	0.054	Y	300.04	0.10	Y	299.93	0.07	
2022-11-ARK-RBT-C1	Beryllium	N	2	N	300.04	2.00	N	299.93	2.00	U
2022-11-ARK-RBT-C1	Manganese	N	197	Y	300.04	7.50	N	299.93	102.27	J
2022-11-ARK-RBT-C1	Zinc	N	155	Y	300.04	29.90	N	299.93	92.46	J
2022-11-ARK-RBT-C1	Aluminum	N	95.1	Y	300.04	49.90	N	299.93	72.50	J
2022-11-ARK-RBT-C1	Lead	N	0.388	Y	300.04	0.10	N	299.93	0.24	J
2022-11-ARK-RBT-C1	Iron	N	291	Y	300.04	99.70	N	299.93	195.37	J
2022-11-ARK-RBT-C1	Cobalt	N	0.738	Y	300.04	0.16	Y	299.93	0.45	
2022-11-ARK-RBT-C1	Cadmium	N	0.1	N	300.04	0.10	N	299.93	0.10	U
2022-11-ARK-RBT-C1	Nickel	N	3.01	Y	300.04	0.50	N	299.93	1.75	J
2022-11-ARK-RBT-C1	Silver	N	0.501	N	300.04	0.50	N	299.93	0.50	U
2022-11-ARK-RBT-C1	Barium	N	10.9	Y	300.04	4.99	N	299.93	7.95	J
2022-11-ARK-RBT-C1	Antimony	N	0.501	N	300.04	0.50	N	299.93	0.50	U
2022-11-ARK-RBT-C1	Arsenic	N	1	N	300.04	1.00	N	299.93	1.00	U
2022-11-ARK-RBT-C1	Thallium	N	1	N	300.04	1.00	N	299.93	1.00	U
2022-11-ARK-RBT-C1	Magnesium	N	1160	Y	300.04	1,140.00	Y	299.93	1,150.00	
2022-11-ARK-RBT-C1	Copper	N	5.42	Y	300.04	1.61	Y	299.93	3.52	
2022-11-ARK-RBT-C1	Vanadium	N	2	N	300.04	1.99	N	299.93	2.00	U
2022-11-ARK-RBT-C1	Sodium	N	4910	Y	300.04	2,730.00	Y	299.93	3,820.20	
2022-11-ARK-RBT-C1	Calcium	N	31800	Y	300.04	2,830.00	Y	299.93	17,317.66	
2022-11-ARK-RBT-C1	Chromium	N	5.19	Y	300.04	5.16	Y	299.93	5.18	
2022-11-ARK-RBT-C1	Selenium	N	8.46	Y	300.04	8.68	Y	299.93	8.57	
2022-11-ARK-RBT-C1	Potassium	N	9720	Y	300.04	18,200.00	Y	299.93	13,959.22	
2022-11-ARK-RBT-C2	Mercury	N	0.05	N	300.00	0.10	Y	300.36	0.08	J
2022-11-ARK-RBT-C2	Beryllium	N	2	N	300.00	2.00	N	300.36	2.00	U
2022-11-ARK-RBT-C2	Manganese	N	188	Y	300.00	7.40	Y	300.36	97.65	
2022-11-ARK-RBT-C2	Zinc	N	125	Y	300.00	29.50	N	300.36	77.22	J
2022-11-ARK-RBT-C2	Aluminum	N	162	Y	300.00	49.20	N	300.36	105.57	J
2022-11-ARK-RBT-C2	Lead	N	0.644	Y	300.00	0.10	N	300.36	0.37	J
2022-11-ARK-RBT-C2	Iron	N	310	Y	300.00	98.30	N	300.36	204.09	J
2022-11-ARK-RBT-C2	Cobalt	N	0.636	Y	300.00	0.17	Y	300.36	0.40	
2022-11-ARK-RBT-C2	Cadmium	N	0.1	N	300.00	0.10	N	300.36	0.10	U
2022-11-ARK-RBT-C2	Nickel	N	2.27	Y	300.00	0.49	N	300.36	1.38	J
2022-11-ARK-RBT-C2	Silver	N	0.501	N	300.00	0.49	N	300.36	0.50	U
2022-11-ARK-RBT-C2	Barium	N	9.48	Y	300.00	4.92	N	300.36	7.20	J
2022-11-ARK-RBT-C2	Antimony	N	0.501	N	300.00	0.55	Y	300.36	0.52	J
2022-11-ARK-RBT-C2	Arsenic	N	1	N	300.00	0.98	N	300.36	0.99	U
2022-11-ARK-RBT-C2	Thallium	N	1	N	300.00	0.98	N	300.36	0.99	U
2022-11-ARK-RBT-C2	Magnesium	N	893	Y	300.00	1,110.00	Y	300.36	1,001.57	
2022-11-ARK-RBT-C2	Copper	N	15.1	Y	300.00	2.25	Y	300.36	8.67	
2022-11-ARK-RBT-C2	Vanadium	N	2.01	N	300.00	1.97	N	300.36	1.99	U
2022-11-ARK-RBT-C2	Sodium	N	3810	Y	300.00	2,790.00	Y	300.36	3,299.69	
2022-11-ARK-RBT-C2	Calcium	N	16000	Y	300.00	3,000.00	Y	300.36	9,496.10	

Table B1-3. Fish Tissue Data

Fish	Analyte	Type	Result Carcass (mg/kg dry)	Detect Carcass	Weight Carcass (g)	Result Filet (mg/kg dry)	Detect Filet	Weight Filet (g)	Result Total (mg/kg dry)	Qualifier Total
2022-11-ARK-RBT-C2	Chromium	N	5.24	Y	300.00	5.11	Y	300.36	5.17	
2022-11-ARK-RBT-C2	Selenium	N	9.41	Y	300.00	8.34	Y	300.36	8.87	
2022-11-ARK-RBT-C2	Potassium	N	8260	Y	300.00	17,800.00	Y	300.36	13,032.86	
2022-11-ARK-RBT-C3	Mercury	N	0.053	Y	300.07	0.10	Y	300.33	0.07	
2022-11-ARK-RBT-C3	Beryllium	N	2	N	300.07	2.00	N	300.33	2.00	U
2022-11-ARK-RBT-C3	Manganese	N	236	Y	300.07	12.10	Y	300.33	124.00	
2022-11-ARK-RBT-C3	Zinc	N	140	Y	300.07	29.90	N	300.33	84.93	J
2022-11-ARK-RBT-C3	Aluminum	N	130	Y	300.07	49.90	N	300.33	89.93	J
2022-11-ARK-RBT-C3	Lead	N	0.495	Y	300.07	0.10	N	300.33	0.30	J
2022-11-ARK-RBT-C3	Iron	N	334	Y	300.07	99.80	N	300.33	216.85	J
2022-11-ARK-RBT-C3	Cobalt	N	0.666	Y	300.07	0.20	Y	300.33	0.43	
2022-11-ARK-RBT-C3	Cadmium	N	0.0992	N	300.07	0.10	N	300.33	0.10	U
2022-11-ARK-RBT-C3	Nickel	N	2.74	Y	300.07	0.50	N	300.33	1.62	J
2022-11-ARK-RBT-C3	Silver	N	0.496	N	300.07	0.50	N	300.33	0.50	U
2022-11-ARK-RBT-C3	Barium	N	13.8	Y	300.07	4.99	N	300.33	9.39	J
2022-11-ARK-RBT-C3	Antimony	N	0.496	N	300.07	0.50	N	300.33	0.50	U
2022-11-ARK-RBT-C3	Arsenic	N	0.992	N	300.07	1.00	N	300.33	1.00	U
2022-11-ARK-RBT-C3	Thallium	N	0.992	N	300.07	1.00	N	300.33	1.00	U
2022-11-ARK-RBT-C3	Magnesium	N	1100	Y	300.07	1,080.00	Y	300.33	1,090.00	
2022-11-ARK-RBT-C3	Copper	N	12.5	Y	300.07	2.50	Y	300.33	7.50	
2022-11-ARK-RBT-C3	Vanadium	N	1.98	N	300.07	2.00	N	300.33	1.99	U
2022-11-ARK-RBT-C3	Sodium	N	5030	Y	300.07	3,790.00	Y	300.33	4,409.73	
2022-11-ARK-RBT-C3	Calcium	N	22700	Y	300.07	3,330.00	Y	300.33	13,010.81	
2022-11-ARK-RBT-C3	Chromium	N	5.41	Y	300.07	5.02	Y	300.33	5.21	
2022-11-ARK-RBT-C3	Selenium	N	9.44	Y	300.07	9.50	Y	300.33	9.47	
2022-11-ARK-RBT-C3	Potassium	N	10100	Y	300.07	16,400.00	Y	300.33	13,251.36	

Notes:

Qualifier Total methodology:

J: Estimated value

U: non detect value

MDL: Method detection limit

mg/kg: Milligram per kilogram

g: Grams

MDL used for non-detect results

Weights used in total calculation:

Sample specific, if available

If not sample specific, used average weight of all non-duplicate samples

Table B2-1. Summary – Runyon Lake, Arkansas River Aquatic Invertebrate Metals: May 2023

Analyte	Total Sample Number	Detect	Detection Frequency	Maximum Detected Concentration (mg/kg dry)	Minimum Detected Concentration (mg/kg dry)	Maximum Non-Detect MDL (mg/kg dry)	½ Maximum MDL if All Non-Detect (mg/kg dry)
Aluminum	9	9	100%	885.000	139.000	-	-
Antimony	9	0	0%	-	-	1.000	0.500
Arsenic	9	6	67%	4.350	2.240	1.980	-
Barium	9	9	100%	147.000	27.000	-	-
Beryllium	9	0	0%	-	-	2.000	1.000
Cadmium	9	9	100%	4.610	0.255	-	-
Calcium	9	9	100%	183,000.000	61,100.000	-	-
Chromium	9	9	100%	4.230	3.510	-	-
Cobalt	9	9	100%	2.790	0.717	-	-
Copper	9	9	100%	231.000	82.400	-	-
Iron	9	9	100%	2,280.000	297.000	-	-
Lead	9	9	100%	9.810	1.850	-	-
Magnesium	9	9	100%	1,960.000	1,380.000	-	-
Manganese	9	9	100%	1,870.000	122.000	-	-
Mercury	9	7	78%	0.100	0.050	0.050	-
Nickel	9	9	100%	18.000	8.290	-	-
Potassium	9	9	100%	10,900.000	3,810.000	-	-
Selenium	9	9	100%	35.900	9.070	-	-
Silver	9	0	0%	-	-	1.000	0.500
Sodium	9	9	100%	9,310.000	3,140.000	-	-
Thallium	9	0	0%	-	-	2.000	1.000
Vanadium	9	6	67%	7.770	4.790	3.960	-
Zinc	9	9	100%	248.000	77.000	-	-

Notes:

MDL: Method detection limit

mg/kg: Milligram per kilogram

Table B2-2. Summary – Aquatic Invertebrate Metals Onsite: May and August 2023

Analyte	Total Sample Number	Detect	Detection Frequency	Maximum Detected Concentration (mg/kg)	Minimum Detected Concentration (mg/kg)	Maximum Non-Detect MDL (mg/kg)	½ Maximum MDL if All Non-Detect (mg/kg)
Aluminum	12	12	100%	1,575.000	139.000	-	-
Antimony	12	2	17%	1.260	0.472	2.500	-
Arsenic	12	9	75%	81.600	2.240	1.980	-
Barium	12	12	100%	147.000	27.000	-	-
Beryllium	12	0	0%	-	-	2.120	1.060
Cadmium	12	12	100%	8.600	0.255	-	-
Calcium	12	12	100%	183,000.000	19,850.000	-	-
Chromium	12	12	100%	7.690	3.510	-	-
Cobalt	12	12	100%	2.910	0.717	-	-
Copper	12	12	100%	231.000	33.350	-	-
Iron	12	12	100%	4,360.000	297.000	-	-
Lead	12	12	100%	93.200	1.850	-	-
Magnesium	12	12	100%	2,350.000	1,380.000	-	-
Manganese	12	12	100%	1,870.000	122.000	-	-
Mercury	12	10	83%	0.190	0.050	0.050	-
Nickel	12	12	100%	18.000	4.720	-	-
Potassium	12	12	100%	10,900.000	3,810.000	-	-
Selenium	12	12	100%	35.900	9.070	-	-
Silver	12	1	8%	0.596	0.596	2.500	-
Sodium	12	12	100%	9,310.000	3,140.000	-	-
Thallium	12	0	0%	-	-	5.000	2.500
Vanadium	12	8	67%	9.750	4.790	9.990	-
Zinc	12	12	100%	642.000	77.000	-	-

Notes:

MDL: Method detection limit

mg/kg: Milligram per kilogram

Table B2-3. Runyon Lake, Arkansas River Aquatic Invertebrate Metals: May 2023

Location	Sample Date	Analyte	Result (mg/kg dry)	Qualifier
Aql-4	05/16/23	Aluminum	706.00	
Aql-4	05/16/23	Antimony	0.98	U
Aql-4	05/16/23	Arsenic	4.35	
Aql-4	05/16/23	Barium	56.00	
Aql-4	05/16/23	Beryllium	1.95	U
Aql-4	05/16/23	Cadmium	4.50	
Aql-4	05/16/23	Calcium	63,400.00	
Aql-4	05/16/23	Chromium	4.04	
Aql-4	05/16/23	Cobalt	2.49	
Aql-4	05/16/23	Copper	84.20	J
Aql-4	05/16/23	Iron	1,900.00	
Aql-4	05/16/23	Lead	4.74	
Aql-4	05/16/23	Magnesium	1,530.00	
Aql-4	05/16/23	Manganese	367.00	
Aql-4	05/16/23	Mercury	0.06	J
Aql-4	05/16/23	Nickel	9.02	
Aql-4	05/16/23	Potassium	7,750.00	
Aql-4	05/16/23	Selenium	35.90	
Aql-4	05/16/23	Silver	0.98	U
Aql-4	05/16/23	Sodium	4,920.00	
Aql-4	05/16/23	Thallium	1.95	U
Aql-4	05/16/23	Vanadium	7.37	
Aql-4	05/16/23	Zinc	192.00	
Aql-4	05/16/23	% Solids	21.10	
Aql-5	05/15/23	Aluminum	681.00	
Aql-5	05/15/23	Antimony	1.00	U
Aql-5	05/15/23	Arsenic	3.20	J
Aql-5	05/15/23	Barium	47.20	
Aql-5	05/15/23	Beryllium	2.00	U
Aql-5	05/15/23	Cadmium	1.47	
Aql-5	05/15/23	Calcium	89,800.00	
Aql-5	05/15/23	Chromium	4.01	
Aql-5	05/15/23	Cobalt	2.68	
Aql-5	05/15/23	Copper	92.70	J
Aql-5	05/15/23	Iron	1,430.00	
Aql-5	05/15/23	Lead	6.03	
Aql-5	05/15/23	Magnesium	1,610.00	
Aql-5	05/15/23	Manganese	247.00	
Aql-5	05/15/23	Mercury	0.05	J
Aql-5	05/15/23	Nickel	10.70	
Aql-5	05/15/23	Potassium	7,390.00	
Aql-5	05/15/23	Selenium	17.60	
Aql-5	05/15/23	Silver	1.00	U
Aql-5	05/15/23	Sodium	5,420.00	
Aql-5	05/15/23	Thallium	2.00	U
Aql-5	05/15/23	Vanadium	6.39	

Table B2-3. Runyon Lake, Arkansas River Aquatic Invertebrate Metals: May 2023

Location	Sample Date	Analyte	Result (mg/kg dry)	Qualifier
AqI-5	05/15/23	Zinc	211.00	
AqI-5	05/15/23	% Solids	17.70	
AqI-6	05/16/23	Aluminum	452.00	
AqI-6	05/16/23	Antimony	0.98	U
AqI-6	05/16/23	Arsenic	1.96	U
AqI-6	05/16/23	Barium	147.00	
AqI-6	05/16/23	Beryllium	1.96	U
AqI-6	05/16/23	Cadmium	0.26	J
AqI-6	05/16/23	Calcium	120,000.00	
AqI-6	05/16/23	Chromium	3.51	J
AqI-6	05/16/23	Cobalt	1.74	
AqI-6	05/16/23	Copper	86.90	J
AqI-6	05/16/23	Iron	987.00	
AqI-6	05/16/23	Lead	2.02	
AqI-6	05/16/23	Magnesium	1,960.00	
AqI-6	05/16/23	Manganese	1,870.00	
AqI-6	05/16/23	Mercury	0.05	J
AqI-6	05/16/23	Nickel	12.10	
AqI-6	05/16/23	Potassium	8,080.00	
AqI-6	05/16/23	Selenium	9.07	
AqI-6	05/16/23	Silver	0.98	U
AqI-6	05/16/23	Sodium	7,020.00	
AqI-6	05/16/23	Thallium	1.96	U
AqI-6	05/16/23	Vanadium	6.43	
AqI-6	05/16/23	Zinc	77.00	
AqI-6	05/16/23	% Solids	25.40	
AqI-7	05/16/23	Aluminum	618.00	
AqI-7	05/16/23	Antimony	0.99	U
AqI-7	05/16/23	Arsenic	3.21	J
AqI-7	05/16/23	Barium	53.40	
AqI-7	05/16/23	Beryllium	1.98	U
AqI-7	05/16/23	Cadmium	4.61	
AqI-7	05/16/23	Calcium	61,100.00	
AqI-7	05/16/23	Chromium	4.15	
AqI-7	05/16/23	Cobalt	2.35	
AqI-7	05/16/23	Copper	87.50	J
AqI-7	05/16/23	Iron	1,390.00	
AqI-7	05/16/23	Lead	3.74	
AqI-7	05/16/23	Magnesium	1,490.00	
AqI-7	05/16/23	Manganese	413.00	
AqI-7	05/16/23	Mercury	0.10	
AqI-7	05/16/23	Nickel	8.29	
AqI-7	05/16/23	Potassium	6,970.00	
AqI-7	05/16/23	Selenium	25.30	
AqI-7	05/16/23	Silver	0.99	U
AqI-7	05/16/23	Sodium	3,990.00	

Table B2-3. Runyon Lake, Arkansas River Aquatic Invertebrate Metals: May 2023

Location	Sample Date	Analyte	Result (mg/kg dry)	Qualifier
Aql-7	05/16/23	Thallium	1.98	U
Aql-7	05/16/23	Vanadium	6.67	
Aql-7	05/16/23	Zinc	182.00	
Aql-7	05/16/23	% Solids	17.10	
Aql-8	05/15/23	Aluminum	391.00	
Aql-8	05/15/23	Antimony	0.98	U
Aql-8	05/15/23	Arsenic	2.33	J
Aql-8	05/15/23	Barium	63.10	
Aql-8	05/15/23	Beryllium	1.97	U
Aql-8	05/15/23	Cadmium	1.21	
Aql-8	05/15/23	Calcium	75,100.00	
Aql-8	05/15/23	Chromium	3.83	J
Aql-8	05/15/23	Cobalt	1.77	
Aql-8	05/15/23	Copper	159.00	J
Aql-8	05/15/23	Iron	941.00	
Aql-8	05/15/23	Lead	7.87	
Aql-8	05/15/23	Magnesium	1,550.00	
Aql-8	05/15/23	Manganese	439.00	
Aql-8	05/15/23	Mercury	0.06	J
Aql-8	05/15/23	Nickel	8.48	
Aql-8	05/15/23	Potassium	8,170.00	
Aql-8	05/15/23	Selenium	19.70	
Aql-8	05/15/23	Silver	0.98	U
Aql-8	05/15/23	Sodium	4,800.00	
Aql-8	05/15/23	Thallium	1.97	U
Aql-8	05/15/23	Vanadium	4.79	J
Aql-8	05/15/23	Zinc	248.00	
Aql-8	05/15/23	% Solids	19.40	
Aql-9	05/15/23	Aluminum	885.00	
Aql-9	05/15/23	Antimony	0.98	U
Aql-9	05/15/23	Arsenic	2.76	J
Aql-9	05/15/23	Barium	44.00	
Aql-9	05/15/23	Beryllium	1.96	U
Aql-9	05/15/23	Cadmium	1.22	
Aql-9	05/15/23	Calcium	183,000.00	
Aql-9	05/15/23	Chromium	4.14	
Aql-9	05/15/23	Cobalt	2.79	
Aql-9	05/15/23	Copper	93.70	J
Aql-9	05/15/23	Iron	2,280.00	
Aql-9	05/15/23	Lead	9.81	
Aql-9	05/15/23	Magnesium	1,600.00	
Aql-9	05/15/23	Manganese	313.00	
Aql-9	05/15/23	Mercury	0.09	J
Aql-9	05/15/23	Nickel	18.00	
Aql-9	05/15/23	Potassium	3,810.00	
Aql-9	05/15/23	Selenium	12.20	

Table B2-3. Runyon Lake, Arkansas River Aquatic Invertebrate Metals: May 2023

Location	Sample Date	Analyte	Result (mg/kg dry)	Qualifier
Aql-9	05/15/23	Silver	0.98	U
Aql-9	05/15/23	Sodium	3,140.00	
Aql-9	05/15/23	Thallium	1.96	U
Aql-9	05/15/23	Vanadium	7.77	
Aql-9	05/15/23	Zinc	147.00	
Aql-9	05/15/23	% Solids	18.00	
Aql-10	05/15/23	Aluminum	166.00	
Aql-10	05/15/23	Antimony	0.98	U
Aql-10	05/15/23	Arsenic	2.24	J
Aql-10	05/15/23	Barium	57.60	
Aql-10	05/15/23	Beryllium	1.96	U
Aql-10	05/15/23	Cadmium	0.33	J
Aql-10	05/15/23	Calcium	80,900.00	
Aql-10	05/15/23	Chromium	4.10	
Aql-10	05/15/23	Cobalt	0.78	
Aql-10	05/15/23	Copper	82.40	J
Aql-10	05/15/23	Iron	379.00	
Aql-10	05/15/23	Lead	1.85	
Aql-10	05/15/23	Magnesium	1,800.00	
Aql-10	05/15/23	Manganese	139.00	
Aql-10	05/15/23	Mercury	0.05	J
Aql-10	05/15/23	Nickel	8.82	
Aql-10	05/15/23	Potassium	10,900.00	
Aql-10	05/15/23	Selenium	24.40	
Aql-10	05/15/23	Silver	0.98	U
Aql-10	05/15/23	Sodium	7,970.00	
Aql-10	05/15/23	Thallium	1.96	U
Aql-10	05/15/23	Vanadium	3.92	U
Aql-10	05/15/23	Zinc	81.00	
Aql-10	05/15/23	% Solids	15.70	
Aql-11	05/15/23	Aluminum	295.00	
Aql-11	05/15/23	Antimony	0.99	U
Aql-11	05/15/23	Arsenic	1.98	U
Aql-11	05/15/23	Barium	53.10	
Aql-11	05/15/23	Beryllium	1.98	U
Aql-11	05/15/23	Cadmium	0.26	J
Aql-11	05/15/23	Calcium	79,700.00	
Aql-11	05/15/23	Chromium	4.23	
Aql-11	05/15/23	Cobalt	0.72	
Aql-11	05/15/23	Copper	140.00	J
Aql-11	05/15/23	Iron	644.00	
Aql-11	05/15/23	Lead	3.10	
Aql-11	05/15/23	Magnesium	1,630.00	
Aql-11	05/15/23	Manganese	180.00	
Aql-11	05/15/23	Mercury	0.05	U
Aql-11	05/15/23	Nickel	8.36	

Table B2-3. Runyon Lake, Arkansas River Aquatic Invertebrate Metals: May 2023

Location	Sample Date	Analyte	Result (mg/kg dry)	Qualifier
Aql-11	05/15/23	Potassium	10,700.00	
Aql-11	05/15/23	Selenium	21.10	
Aql-11	05/15/23	Silver	0.99	U
Aql-11	05/15/23	Sodium	9,010.00	
Aql-11	05/15/23	Thallium	1.98	U
Aql-11	05/15/23	Vanadium	3.96	U
Aql-11	05/15/23	Zinc	92.00	
Aql-11	05/15/23	% Solids	16.80	
Aql-12	05/15/23	Aluminum	139.00	
Aql-12	05/15/23	Antimony	0.99	U
Aql-12	05/15/23	Arsenic	1.97	U
Aql-12	05/15/23	Barium	27.00	
Aql-12	05/15/23	Beryllium	1.97	U
Aql-12	05/15/23	Cadmium	0.41	
Aql-12	05/15/23	Calcium	79,800.00	
Aql-12	05/15/23	Chromium	4.20	
Aql-12	05/15/23	Cobalt	0.77	
Aql-12	05/15/23	Copper	231.00	J
Aql-12	05/15/23	Iron	297.00	
Aql-12	05/15/23	Lead	2.49	
Aql-12	05/15/23	Magnesium	1,380.00	
Aql-12	05/15/23	Manganese	122.00	
Aql-12	05/15/23	Mercury	0.05	U
Aql-12	05/15/23	Nickel	9.72	
Aql-12	05/15/23	Potassium	10,600.00	
Aql-12	05/15/23	Selenium	15.80	
Aql-12	05/15/23	Silver	0.99	U
Aql-12	05/15/23	Sodium	9,310.00	
Aql-12	05/15/23	Thallium	1.97	U
Aql-12	05/15/23	Vanadium	3.94	U
Aql-12	05/15/23	Zinc	118.00	
Aql-12	05/15/23	% Solids	17.60	

Notes:

J: Estimated value

U: non detect value

MDL: Method detection limit

mg/kg: Milligram per kilogram

MDL used for non-detect results, per data source

All data converted to mg/kg (except percent solids)

Table B2-4. Aquatic Invertebrate Metals Onsite: May and August 2023

Location	Sample Name	Sample Date	Sample Type	Analyte	Result (mg/kg dry)	Qualifier
Aql-1	AQI-1_01_TISINV	08/14/23	N	Aluminum	1,540.00	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Antimony	2.50	U
Aql-1	AQI-1_01_TISINV	08/14/23	N	Arsenic	10.00	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Barium	83.90	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Beryllium	2.00	U
Aql-1	AQI-1_01_TISINV	08/14/23	N	Cadmium	5.24	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Calcium	104,000.00	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Chromium	7.69	J
Aql-1	AQI-1_01_TISINV	08/14/23	N	Cobalt	2.91	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Copper	52.30	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Iron	3,680.00	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Lead	93.20	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Magnesium	2,350.00	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Manganese	279.00	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Mercury	0.19	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Nickel	11.40	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Potassium	4,100.00	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Selenium	25.70	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Silver	2.50	U
Aql-1	AQI-1_01_TISINV	08/14/23	N	Sodium	3,300.00	
Aql-1	AQI-1_01_TISINV	08/14/23	N	Thallium	5.00	U
Aql-1	AQI-1_01_TISINV	08/14/23	N	Vanadium	9.99	U
Aql-1	AQI-1_01_TISINV	08/14/23	N	Zinc	325.00	
Aql-1	AQI-1_01_TISINV	08/14/23	N	% Solids	22.30	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Aluminum	1,800.00	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Antimony	0.50	U
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Arsenic	1.88	J
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Barium	35.30	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Beryllium	1.98	U
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Cadmium	0.71	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Calcium	25,400.00	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Chromium	6.20	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Cobalt	0.87	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Copper	33.90	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Iron	2,920.00	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Lead	18.10	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Magnesium	2,120.00	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Manganese	261.00	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Mercury	0.11	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Nickel	3.54	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Potassium	7,610.00	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Selenium	9.43	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Silver	0.50	U
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Sodium	6,350.00	
Aql-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Thallium	0.99	U

Table B2-4. Aquatic Invertebrate Metals Onsite: May and August 2023

Location	Sample Name	Sample Date	Sample Type	Analyte	Result (mg/kg dry)	Qualifier
AqI-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Vanadium	8.21	
AqI-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	Zinc	109.00	
AqI-2	AQI-1_DUP-01_02_TISINV	08/14/23	DUP	% Solids	19.50	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Aluminum	1,350.00	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Antimony	0.70	J
AqI-2	AQI-2_01_TISINV	08/14/23	N	Arsenic	7.81	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Barium	40.30	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Beryllium	1.91	U
AqI-2	AQI-2_01_TISINV	08/14/23	N	Cadmium	2.32	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Calcium	14,300.00	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Chromium	9.11	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Cobalt	2.12	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Copper	32.80	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Iron	5,130.00	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Lead	22.40	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Magnesium	1,980.00	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Manganese	338.00	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Mercury	0.21	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Nickel	5.90	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Potassium	7,350.00	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Selenium	28.80	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Silver	0.48	U
AqI-2	AQI-2_01_TISINV	08/14/23	N	Sodium	5,410.00	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Thallium	0.96	U
AqI-2	AQI-2_01_TISINV	08/14/23	N	Vanadium	8.92	
AqI-2	AQI-2_01_TISINV	08/14/23	N	Zinc	143.00	
AqI-2	AQI-2_01_TISINV	08/14/23	N	% Solids	19.30	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Aluminum	973.00	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Antimony	1.26	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Arsenic	81.60	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Barium	50.60	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Beryllium	2.12	U
AqI-3	AQI-3_01_TISINV	08/14/23	N	Cadmium	8.60	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Calcium	38,200.00	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Chromium	3.72	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Cobalt	2.66	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Copper	94.40	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Iron	4,360.00	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Lead	66.00	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Magnesium	2,270.00	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Manganese	284.00	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Mercury	0.10	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Nickel	12.30	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Potassium	4,180.00	
AqI-3	AQI-3_01_TISINV	08/14/23	N	Selenium	33.10	

Table B2-4. Aquatic Invertebrate Metals Onsite: May and August 2023

Location	Sample Name	Sample Date	Sample Type	Analyte	Result (mg/kg dry)	Qualifier
Aql-3	AQI-3_01_TISINV	08/14/23	N	Silver	0.60	J
Aql-3	AQI-3_01_TISINV	08/14/23	N	Sodium	3,810.00	
Aql-3	AQI-3_01_TISINV	08/14/23	N	Thallium	1.06	U
Aql-3	AQI-3_01_TISINV	08/14/23	N	Vanadium	9.75	
Aql-3	AQI-3_01_TISINV	08/14/23	N	Zinc	642.00	
Aql-3	AQI-3_01_TISINV	08/14/23	N	% Solids	16.50	
Aql-4	AQL-4-01	05/16/23	N	Aluminum	706.00	
Aql-4	AQL-4-01	05/16/23	N	Antimony	0.98	U
Aql-4	AQL-4-01	05/16/23	N	Arsenic	4.35	
Aql-4	AQL-4-01	05/16/23	N	Barium	56.00	
Aql-4	AQL-4-01	05/16/23	N	Beryllium	1.95	U
Aql-4	AQL-4-01	05/16/23	N	Cadmium	4.50	
Aql-4	AQL-4-01	05/16/23	N	Calcium	63,400.00	
Aql-4	AQL-4-01	05/16/23	N	Chromium	4.04	
Aql-4	AQL-4-01	05/16/23	N	Cobalt	2.49	
Aql-4	AQL-4-01	05/16/23	N	Copper	84.20	J
Aql-4	AQL-4-01	05/16/23	N	Iron	1,900.00	
Aql-4	AQL-4-01	05/16/23	N	Lead	4.74	
Aql-4	AQL-4-01	05/16/23	N	Magnesium	1,530.00	
Aql-4	AQL-4-01	05/16/23	N	Manganese	367.00	
Aql-4	AQL-4-01	05/16/23	N	Mercury	0.06	J
Aql-4	AQL-4-01	05/16/23	N	Nickel	9.02	
Aql-4	AQL-4-01	05/16/23	N	Potassium	7,750.00	
Aql-4	AQL-4-01	05/16/23	N	Selenium	35.90	
Aql-4	AQL-4-01	05/16/23	N	Silver	0.98	U
Aql-4	AQL-4-01	05/16/23	N	Sodium	4,920.00	
Aql-4	AQL-4-01	05/16/23	N	Thallium	1.95	U
Aql-4	AQL-4-01	05/16/23	N	Vanadium	7.37	
Aql-4	AQL-4-01	05/16/23	N	Zinc	192.00	
Aql-4	AQL-4-01	05/16/23	N	% Solids	21.10	
Aql-5	AQL-5-01	05/15/23	N	Aluminum	681.00	
Aql-5	AQL-5-01	05/15/23	N	Antimony	1.00	U
Aql-5	AQL-5-01	05/15/23	N	Arsenic	3.20	J
Aql-5	AQL-5-01	05/15/23	N	Barium	47.20	
Aql-5	AQL-5-01	05/15/23	N	Beryllium	2.00	U
Aql-5	AQL-5-01	05/15/23	N	Cadmium	1.47	
Aql-5	AQL-5-01	05/15/23	N	Calcium	89,800.00	
Aql-5	AQL-5-01	05/15/23	N	Chromium	4.01	
Aql-5	AQL-5-01	05/15/23	N	Cobalt	2.68	
Aql-5	AQL-5-01	05/15/23	N	Copper	92.70	J
Aql-5	AQL-5-01	05/15/23	N	Iron	1,430.00	
Aql-5	AQL-5-01	05/15/23	N	Lead	6.03	
Aql-5	AQL-5-01	05/15/23	N	Magnesium	1,610.00	
Aql-5	AQL-5-01	05/15/23	N	Manganese	247.00	
Aql-5	AQL-5-01	05/15/23	N	Mercury	0.05	J

Table B2-4. Aquatic Invertebrate Metals Onsite: May and August 2023

Location	Sample Name	Sample Date	Sample Type	Analyte	Result (mg/kg dry)	Qualifier
Aql-5	AQL-5-01	05/15/23	N	Nickel	10.70	
Aql-5	AQL-5-01	05/15/23	N	Potassium	7,390.00	
Aql-5	AQL-5-01	05/15/23	N	Selenium	17.60	
Aql-5	AQL-5-01	05/15/23	N	Silver	1.00	U
Aql-5	AQL-5-01	05/15/23	N	Sodium	5,420.00	
Aql-5	AQL-5-01	05/15/23	N	Thallium	2.00	U
Aql-5	AQL-5-01	05/15/23	N	Vanadium	6.39	
Aql-5	AQL-5-01	05/15/23	N	Zinc	211.00	
Aql-5	AQL-5-01	05/15/23	N	% Solids	17.70	
Aql-6	AQL-6-01	05/16/23	N	Aluminum	452.00	
Aql-6	AQL-6-01	05/16/23	N	Antimony	0.98	U
Aql-6	AQL-6-01	05/16/23	N	Arsenic	1.96	U
Aql-6	AQL-6-01	05/16/23	N	Barium	147.00	
Aql-6	AQL-6-01	05/16/23	N	Beryllium	1.96	U
Aql-6	AQL-6-01	05/16/23	N	Cadmium	0.26	J
Aql-6	AQL-6-01	05/16/23	N	Calcium	120,000.00	
Aql-6	AQL-6-01	05/16/23	N	Chromium	3.51	J
Aql-6	AQL-6-01	05/16/23	N	Cobalt	1.74	
Aql-6	AQL-6-01	05/16/23	N	Copper	86.90	J
Aql-6	AQL-6-01	05/16/23	N	Iron	987.00	
Aql-6	AQL-6-01	05/16/23	N	Lead	2.02	
Aql-6	AQL-6-01	05/16/23	N	Magnesium	1,960.00	
Aql-6	AQL-6-01	05/16/23	N	Manganese	1,870.00	
Aql-6	AQL-6-01	05/16/23	N	Mercury	0.05	J
Aql-6	AQL-6-01	05/16/23	N	Nickel	12.10	
Aql-6	AQL-6-01	05/16/23	N	Potassium	8,080.00	
Aql-6	AQL-6-01	05/16/23	N	Selenium	9.07	
Aql-6	AQL-6-01	05/16/23	N	Silver	0.98	U
Aql-6	AQL-6-01	05/16/23	N	Sodium	7,020.00	
Aql-6	AQL-6-01	05/16/23	N	Thallium	1.96	U
Aql-6	AQL-6-01	05/16/23	N	Vanadium	6.43	
Aql-6	AQL-6-01	05/16/23	N	Zinc	77.00	
Aql-6	AQL-6-01	05/16/23	N	% Solids	25.40	
Aql-7	AQL-7-01	05/16/23	N	Aluminum	618.00	
Aql-7	AQL-7-01	05/16/23	N	Antimony	0.99	U
Aql-7	AQL-7-01	05/16/23	N	Arsenic	3.21	J
Aql-7	AQL-7-01	05/16/23	N	Barium	53.40	
Aql-7	AQL-7-01	05/16/23	N	Beryllium	1.98	U
Aql-7	AQL-7-01	05/16/23	N	Cadmium	4.61	
Aql-7	AQL-7-01	05/16/23	N	Calcium	61,100.00	
Aql-7	AQL-7-01	05/16/23	N	Chromium	4.15	
Aql-7	AQL-7-01	05/16/23	N	Cobalt	2.35	
Aql-7	AQL-7-01	05/16/23	N	Copper	87.50	J
Aql-7	AQL-7-01	05/16/23	N	Iron	1,390.00	
Aql-7	AQL-7-01	05/16/23	N	Lead	3.74	

Table B2-4. Aquatic Invertebrate Metals Onsite: May and August 2023

Location	Sample Name	Sample Date	Sample Type	Analyte	Result (mg/kg dry)	Qualifier
Aql-7	AQL-7-01	05/16/23	N	Magnesium	1,490.00	
Aql-7	AQL-7-01	05/16/23	N	Manganese	413.00	
Aql-7	AQL-7-01	05/16/23	N	Mercury	0.10	
Aql-7	AQL-7-01	05/16/23	N	Nickel	8.29	
Aql-7	AQL-7-01	05/16/23	N	Potassium	6,970.00	
Aql-7	AQL-7-01	05/16/23	N	Selenium	25.30	
Aql-7	AQL-7-01	05/16/23	N	Silver	0.99	U
Aql-7	AQL-7-01	05/16/23	N	Sodium	3,990.00	
Aql-7	AQL-7-01	05/16/23	N	Thallium	1.98	U
Aql-7	AQL-7-01	05/16/23	N	Vanadium	6.67	
Aql-7	AQL-7-01	05/16/23	N	Zinc	182.00	
Aql-7	AQL-7-01	05/16/23	N	% Solids	17.10	
Aql-8	AQL-8-01	05/15/23	N	Aluminum	391.00	
Aql-8	AQL-8-01	05/15/23	N	Antimony	0.98	U
Aql-8	AQL-8-01	05/15/23	N	Arsenic	2.33	J
Aql-8	AQL-8-01	05/15/23	N	Barium	63.10	
Aql-8	AQL-8-01	05/15/23	N	Beryllium	1.97	U
Aql-8	AQL-8-01	05/15/23	N	Cadmium	1.21	
Aql-8	AQL-8-01	05/15/23	N	Calcium	75,100.00	
Aql-8	AQL-8-01	05/15/23	N	Chromium	3.83	J
Aql-8	AQL-8-01	05/15/23	N	Cobalt	1.77	
Aql-8	AQL-8-01	05/15/23	N	Copper	159.00	J
Aql-8	AQL-8-01	05/15/23	N	Iron	941.00	
Aql-8	AQL-8-01	05/15/23	N	Lead	7.87	
Aql-8	AQL-8-01	05/15/23	N	Magnesium	1,550.00	
Aql-8	AQL-8-01	05/15/23	N	Manganese	439.00	
Aql-8	AQL-8-01	05/15/23	N	Mercury	0.06	J
Aql-8	AQL-8-01	05/15/23	N	Nickel	8.48	
Aql-8	AQL-8-01	05/15/23	N	Potassium	8,170.00	
Aql-8	AQL-8-01	05/15/23	N	Selenium	19.70	
Aql-8	AQL-8-01	05/15/23	N	Silver	0.98	U
Aql-8	AQL-8-01	05/15/23	N	Sodium	4,800.00	
Aql-8	AQL-8-01	05/15/23	N	Thallium	1.97	U
Aql-8	AQL-8-01	05/15/23	N	Vanadium	4.79	J
Aql-8	AQL-8-01	05/15/23	N	Zinc	248.00	
Aql-8	AQL-8-01	05/15/23	N	% Solids	19.40	
Aql-9	AQL-9-01	05/15/23	N	Aluminum	885.00	
Aql-9	AQL-9-01	05/15/23	N	Antimony	0.98	U
Aql-9	AQL-9-01	05/15/23	N	Arsenic	2.76	J
Aql-9	AQL-9-01	05/15/23	N	Barium	44.00	
Aql-9	AQL-9-01	05/15/23	N	Beryllium	1.96	U
Aql-9	AQL-9-01	05/15/23	N	Cadmium	1.22	
Aql-9	AQL-9-01	05/15/23	N	Calcium	183,000.00	
Aql-9	AQL-9-01	05/15/23	N	Chromium	4.14	
Aql-9	AQL-9-01	05/15/23	N	Cobalt	2.79	

Table B2-4. Aquatic Invertebrate Metals Onsite: May and August 2023

Location	Sample Name	Sample Date	Sample Type	Analyte	Result (mg/kg dry)	Qualifier
Aql-9	AQL-9-01	05/15/23	N	Copper	93.70	J
Aql-9	AQL-9-01	05/15/23	N	Iron	2,280.00	
Aql-9	AQL-9-01	05/15/23	N	Lead	9.81	
Aql-9	AQL-9-01	05/15/23	N	Magnesium	1,600.00	
Aql-9	AQL-9-01	05/15/23	N	Manganese	313.00	
Aql-9	AQL-9-01	05/15/23	N	Mercury	0.09	J
Aql-9	AQL-9-01	05/15/23	N	Nickel	18.00	
Aql-9	AQL-9-01	05/15/23	N	Potassium	3,810.00	
Aql-9	AQL-9-01	05/15/23	N	Selenium	12.20	
Aql-9	AQL-9-01	05/15/23	N	Silver	0.98	U
Aql-9	AQL-9-01	05/15/23	N	Sodium	3,140.00	
Aql-9	AQL-9-01	05/15/23	N	Thallium	1.96	U
Aql-9	AQL-9-01	05/15/23	N	Vanadium	7.77	
Aql-9	AQL-9-01	05/15/23	N	Zinc	147.00	
Aql-9	AQL-9-01	05/15/23	N	% Solids	18.00	
Aql-10	AQL-10-01	05/15/23	N	Aluminum	166.00	
Aql-10	AQL-10-01	05/15/23	N	Antimony	0.98	U
Aql-10	AQL-10-01	05/15/23	N	Arsenic	2.24	J
Aql-10	AQL-10-01	05/15/23	N	Barium	57.60	
Aql-10	AQL-10-01	05/15/23	N	Beryllium	1.96	U
Aql-10	AQL-10-01	05/15/23	N	Cadmium	0.33	J
Aql-10	AQL-10-01	05/15/23	N	Calcium	80,900.00	
Aql-10	AQL-10-01	05/15/23	N	Chromium	4.10	
Aql-10	AQL-10-01	05/15/23	N	Cobalt	0.78	
Aql-10	AQL-10-01	05/15/23	N	Copper	82.40	J
Aql-10	AQL-10-01	05/15/23	N	Iron	379.00	
Aql-10	AQL-10-01	05/15/23	N	Lead	1.85	
Aql-10	AQL-10-01	05/15/23	N	Magnesium	1,800.00	
Aql-10	AQL-10-01	05/15/23	N	Manganese	139.00	
Aql-10	AQL-10-01	05/15/23	N	Mercury	0.05	J
Aql-10	AQL-10-01	05/15/23	N	Nickel	8.82	
Aql-10	AQL-10-01	05/15/23	N	Potassium	10,900.00	
Aql-10	AQL-10-01	05/15/23	N	Selenium	24.40	
Aql-10	AQL-10-01	05/15/23	N	Silver	0.98	U
Aql-10	AQL-10-01	05/15/23	N	Sodium	7,970.00	
Aql-10	AQL-10-01	05/15/23	N	Thallium	1.96	U
Aql-10	AQL-10-01	05/15/23	N	Vanadium	3.92	U
Aql-10	AQL-10-01	05/15/23	N	Zinc	81.00	
Aql-10	AQL-10-01	05/15/23	N	% Solids	15.70	
Aql-11	AQL-11-01	05/15/23	N	Aluminum	295.00	
Aql-11	AQL-11-01	05/15/23	N	Antimony	0.99	U
Aql-11	AQL-11-01	05/15/23	N	Arsenic	1.98	U
Aql-11	AQL-11-01	05/15/23	N	Barium	53.10	
Aql-11	AQL-11-01	05/15/23	N	Beryllium	1.98	U
Aql-11	AQL-11-01	05/15/23	N	Cadmium	0.26	J

Table B2-4. Aquatic Invertebrate Metals Onsite: May and August 2023

Location	Sample Name	Sample Date	Sample Type	Analyte	Result (mg/kg dry)	Qualifier
Aql-11	AQL-11-01	05/15/23	N	Calcium	79,700.00	
Aql-11	AQL-11-01	05/15/23	N	Chromium	4.23	
Aql-11	AQL-11-01	05/15/23	N	Cobalt	0.72	
Aql-11	AQL-11-01	05/15/23	N	Copper	140.00	J
Aql-11	AQL-11-01	05/15/23	N	Iron	644.00	
Aql-11	AQL-11-01	05/15/23	N	Lead	3.10	
Aql-11	AQL-11-01	05/15/23	N	Magnesium	1,630.00	
Aql-11	AQL-11-01	05/15/23	N	Manganese	180.00	
Aql-11	AQL-11-01	05/15/23	N	Mercury	0.05	U
Aql-11	AQL-11-01	05/15/23	N	Nickel	8.36	
Aql-11	AQL-11-01	05/15/23	N	Potassium	10,700.00	
Aql-11	AQL-11-01	05/15/23	N	Selenium	21.10	
Aql-11	AQL-11-01	05/15/23	N	Silver	0.99	U
Aql-11	AQL-11-01	05/15/23	N	Sodium	9,010.00	
Aql-11	AQL-11-01	05/15/23	N	Thallium	1.98	U
Aql-11	AQL-11-01	05/15/23	N	Vanadium	3.96	U
Aql-11	AQL-11-01	05/15/23	N	Zinc	92.00	
Aql-11	AQL-11-01	05/15/23	N	% Solids	16.80	
Aql-12	AQL-12-01	05/15/23	N	Aluminum	139.00	
Aql-12	AQL-12-01	05/15/23	N	Antimony	0.99	U
Aql-12	AQL-12-01	05/15/23	N	Arsenic	1.97	U
Aql-12	AQL-12-01	05/15/23	N	Barium	27.00	
Aql-12	AQL-12-01	05/15/23	N	Beryllium	1.97	U
Aql-12	AQL-12-01	05/15/23	N	Cadmium	0.41	
Aql-12	AQL-12-01	05/15/23	N	Calcium	79,800.00	
Aql-12	AQL-12-01	05/15/23	N	Chromium	4.20	
Aql-12	AQL-12-01	05/15/23	N	Cobalt	0.77	
Aql-12	AQL-12-01	05/15/23	N	Copper	231.00	J
Aql-12	AQL-12-01	05/15/23	N	Iron	297.00	
Aql-12	AQL-12-01	05/15/23	N	Lead	2.49	
Aql-12	AQL-12-01	05/15/23	N	Magnesium	1,380.00	
Aql-12	AQL-12-01	05/15/23	N	Manganese	122.00	
Aql-12	AQL-12-01	05/15/23	N	Mercury	0.05	U
Aql-12	AQL-12-01	05/15/23	N	Nickel	9.72	
Aql-12	AQL-12-01	05/15/23	N	Potassium	10,600.00	
Aql-12	AQL-12-01	05/15/23	N	Selenium	15.80	
Aql-12	AQL-12-01	05/15/23	N	Silver	0.99	U
Aql-12	AQL-12-01	05/15/23	N	Sodium	9,310.00	
Aql-12	AQL-12-01	05/15/23	N	Thallium	1.97	U
Aql-12	AQL-12-01	05/15/23	N	Vanadium	3.94	U
Aql-12	AQL-12-01	05/15/23	N	Zinc	118.00	
Aql-12	AQL-12-01	05/15/23	N	% Solids	17.60	

Table B2-4. Aquatic Invertebrate Metals Onsite: May and August 2023

Location	Sample Name	Sample Date	Sample Type	Analyte	Result (mg/kg dry)	Qualifier

Notes:

J: Estimated value

U: non detect value

MDL: Method detection limit

mg/kg: Milligram per kilogram

DUP: Sample duplicate

N: Normal sample

MDL used for non-detect results, per data source

All data converted to mg/kg (except percent solids)

Table B3-1. Summary – Mice Metals from DU-0023: October 2023

Analyte	Total Sample Number	Detect	Detection Frequency	Maximum Detected Concentration (mg/kg)	Minimum Detected Concentration (mg/kg)	Maximum Non-Detect MDL (mg/kg)	½ Maximum MDL if All Non-Detect (mg/kg)
Aluminum	5	5	100%	71.300	30.500	-	-
Antimony	5	0	0%	-	-	2.540	1.270
Arsenic	5	3	60%	1.040	0.968	2.540	-
Barium	5	5	100%	8.110	2.530	-	-
Beryllium	5	0	0%	-	-	1.000	0.500
Cadmium	5	2	40%	0.324	0.324	0.508	-
Calcium	5	5	100%	33,750.000	15,300.000	-	-
Chromium	5	4	80%	6.130	3.125	5.000	-
Cobalt	5	2	40%	0.221	0.221	0.508	-
Copper	5	5	100%	64.300	12.200	-	-
Iron	5	5	100%	333.000	210.000	-	-
Lead	5	5	100%	47.500	11.600	-	-
Magnesium	5	5	100%	1,600.000	1,210.000	-	-
Manganese	5	5	100%	11.200	6.300	-	-
Mercury	5	5	100%	0.080	0.010	-	-
Nickel	5	5	100%	3.845	3.160	-	-
Potassium	5	5	100%	11,600.000	8,740.000	-	-
Selenium	5	2	40%	2.140	2.140	5.080	-
Silver	5	0	0%	-	-	2.540	1.270
Sodium	5	5	100%	4,330.000	3,470.000	-	-
Thallium	5	0	0%	-	-	5.080	2.540
Vanadium	5	0	0%	-	-	10.200	5.100
Zinc	5	5	100%	195.000	117.000	-	-

Table B3-2. Mice Metals from DU-0023: October 2023

Sample Name	Sample Date	Sample Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0023-M-01_01_TIS	10/05/23	N	Aluminum	40.50	J
DU-0023-M-01_01_TIS	10/05/23	N	Antimony	2.50	U
DU-0023-M-01_01_TIS	10/05/23	N	Arsenic	2.50	U
DU-0023-M-01_01_TIS	10/05/23	N	Barium	2.53	J
DU-0023-M-01_01_TIS	10/05/23	N	Beryllium	1.00	U
DU-0023-M-01_01_TIS	10/05/23	N	Cadmium	0.50	U
DU-0023-M-01_01_TIS	10/05/23	N	Calcium	26,500.00	
DU-0023-M-01_01_TIS	10/05/23	N	Chromium	5.00	U
DU-0023-M-01_01_TIS	10/05/23	N	Cobalt	0.50	U
DU-0023-M-01_01_TIS	10/05/23	N	Copper	12.20	
DU-0023-M-01_01_TIS	10/05/23	N	Iron	210.00	J
DU-0023-M-01_01_TIS	10/05/23	N	Lead	47.50	
DU-0023-M-01_01_TIS	10/05/23	N	Magnesium	1,390.00	
DU-0023-M-01_01_TIS	10/05/23	N	Manganese	11.20	
DU-0023-M-01_01_TIS	10/05/23	N	Mercury	0.01	J
DU-0023-M-01_01_TIS	10/05/23	N	Nickel	3.63	J
DU-0023-M-01_01_TIS	10/05/23	N	Potassium	8,740.00	
DU-0023-M-01_01_TIS	10/05/23	N	Selenium	5.00	U
DU-0023-M-01_01_TIS	10/05/23	N	Silver	2.50	U
DU-0023-M-01_01_TIS	10/05/23	N	Sodium	3,620.00	
DU-0023-M-01_01_TIS	10/05/23	N	Thallium	5.00	U
DU-0023-M-01_01_TIS	10/05/23	N	Vanadium	9.99	U
DU-0023-M-01_01_TIS	10/05/23	N	Zinc	117.00	
DU-0023-M-01_01_TIS	10/05/23	N	% Solids	34.50	
DU-0023-M-02_01_TIS	10/05/23	N	Aluminum	71.30	
DU-0023-M-02_01_TIS	10/05/23	N	Antimony	2.54	U
DU-0023-M-02_01_TIS	10/05/23	N	Arsenic	2.54	U
DU-0023-M-02_01_TIS	10/05/23	N	Barium	8.11	
DU-0023-M-02_01_TIS	10/05/23	N	Beryllium	1.00	U
DU-0023-M-02_01_TIS	10/05/23	N	Cadmium	0.51	U
DU-0023-M-02_01_TIS	10/05/23	N	Calcium	15,300.00	
DU-0023-M-02_01_TIS	10/05/23	N	Chromium	6.13	J
DU-0023-M-02_01_TIS	10/05/23	N	Cobalt	0.51	U
DU-0023-M-02_01_TIS	10/05/23	N	Copper	23.40	
DU-0023-M-02_01_TIS	10/05/23	N	Iron	333.00	
DU-0023-M-02_01_TIS	10/05/23	N	Lead	13.80	
DU-0023-M-02_01_TIS	10/05/23	N	Magnesium	1,300.00	
DU-0023-M-02_01_TIS	10/05/23	N	Manganese	11.00	
DU-0023-M-02_01_TIS	10/05/23	N	Mercury	0.01	J
DU-0023-M-02_01_TIS	10/05/23	N	Nickel	3.16	J
DU-0023-M-02_01_TIS	10/05/23	N	Potassium	11,600.00	
DU-0023-M-02_01_TIS	10/05/23	N	Selenium	5.08	U
DU-0023-M-02_01_TIS	10/05/23	N	Silver	2.54	U
DU-0023-M-02_01_TIS	10/05/23	N	Sodium	4,190.00	
DU-0023-M-02_01_TIS	10/05/23	N	Thallium	5.08	U

Table B3-2. Mice Metals from DU-0023: October 2023

Sample Name	Sample Date	Sample Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0023-M-02_01_TIS	10/05/23	N	Vanadium	10.20	U
DU-0023-M-02_01_TIS	10/05/23	N	Zinc	195.00	
DU-0023-M-02_01_TIS	10/05/23	N	% Solids	30.60	
DU-0023-M-03_01_TIS	10/05/23	N	Aluminum	35.30	J
DU-0023-M-03_01_TIS	10/05/23	N	Antimony	2.51	U
DU-0023-M-03_01_TIS	10/05/23	N	Arsenic	2.51	U
DU-0023-M-03_01_TIS	10/05/23	N	Barium	7.13	
DU-0023-M-03_01_TIS	10/05/23	N	Beryllium	1.00	U
DU-0023-M-03_01_TIS	10/05/23	N	Cadmium	0.50	U
DU-0023-M-03_01_TIS	10/05/23	N	Calcium	29,200.00	
DU-0023-M-03_01_TIS	10/05/23	N	Chromium	5.02	U
DU-0023-M-03_01_TIS	10/05/23	N	Cobalt	0.50	U
DU-0023-M-03_01_TIS	10/05/23	N	Copper	29.80	
DU-0023-M-03_01_TIS	10/05/23	N	Iron	321.00	
DU-0023-M-03_01_TIS	10/05/23	N	Lead	24.70	
DU-0023-M-03_01_TIS	10/05/23	N	Magnesium	1,580.00	
DU-0023-M-03_01_TIS	10/05/23	N	Manganese	9.20	
DU-0023-M-03_01_TIS	10/05/23	N	Mercury	0.01	J
DU-0023-M-03_01_TIS	10/05/23	N	Nickel	4.36	J
DU-0023-M-03_01_TIS	10/05/23	N	Potassium	10,800.00	
DU-0023-M-03_01_TIS	10/05/23	N	Selenium	5.02	U
DU-0023-M-03_01_TIS	10/05/23	N	Silver	2.51	U
DU-0023-M-03_01_TIS	10/05/23	N	Sodium	4,340.00	
DU-0023-M-03_01_TIS	10/05/23	N	Thallium	5.02	U
DU-0023-M-03_01_TIS	10/05/23	N	Vanadium	10.00	U
DU-0023-M-03_01_TIS	10/05/23	N	Zinc	119.00	
DU-0023-M-03_01_TIS	10/05/23	N	% Solids	32.70	
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Aluminum	25.70	J
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Antimony	0.50	U
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Arsenic	0.68	J
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Barium	8.49	
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Beryllium	1.00	U
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Cadmium	0.40	J
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Calcium	38,300.00	
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Chromium	3.74	
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Cobalt	0.19	J
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Copper	24.80	
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Iron	287.00	
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Lead	29.20	
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Magnesium	1,620.00	
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Manganese	7.00	
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Mercury	0.01	J
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Nickel	3.33	
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Potassium	10,300.00	
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Selenium	1.77	J

Table B3-2. Mice Metals from DU-0023: October 2023

Sample Name	Sample Date	Sample Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Silver	0.50	U
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Sodium	4,320.00	
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Thallium	0.99	U
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Vanadium	1.98	U
DU-0023-M-03_01_TIS-DUP	10/05/23	DUP	Zinc	118.00	
DU-0023-M-04_01_TIS	10/06/23	N	Aluminum	56.20	
DU-0023-M-04_01_TIS	10/06/23	N	Antimony	1.00	U
DU-0023-M-04_01_TIS	10/06/23	N	Arsenic	1.04	J
DU-0023-M-04_01_TIS	10/06/23	N	Barium	2.75	
DU-0023-M-04_01_TIS	10/06/23	N	Beryllium	1.00	U
DU-0023-M-04_01_TIS	10/06/23	N	Cadmium	0.20	U
DU-0023-M-04_01_TIS	10/06/23	N	Calcium	18,300.00	
DU-0023-M-04_01_TIS	10/06/23	N	Chromium	5.10	
DU-0023-M-04_01_TIS	10/06/23	N	Cobalt	0.20	U
DU-0023-M-04_01_TIS	10/06/23	N	Copper	64.30	
DU-0023-M-04_01_TIS	10/06/23	N	Iron	329.00	
DU-0023-M-04_01_TIS	10/06/23	N	Lead	11.60	
DU-0023-M-04_01_TIS	10/06/23	N	Magnesium	1,210.00	
DU-0023-M-04_01_TIS	10/06/23	N	Manganese	6.30	
DU-0023-M-04_01_TIS	10/06/23	N	Mercury	0.08	
DU-0023-M-04_01_TIS	10/06/23	N	Nickel	3.52	
DU-0023-M-04_01_TIS	10/06/23	N	Potassium	10,600.00	
DU-0023-M-04_01_TIS	10/06/23	N	Selenium	2.00	U
DU-0023-M-04_01_TIS	10/06/23	N	Silver	1.00	U
DU-0023-M-04_01_TIS	10/06/23	N	Sodium	3,470.00	
DU-0023-M-04_01_TIS	10/06/23	N	Thallium	2.00	U
DU-0023-M-04_01_TIS	10/06/23	N	Vanadium	4.00	U
DU-0023-M-04_01_TIS	10/06/23	N	Zinc	129.00	
DU-0023-M-04_01_TIS	10/06/23	N	% Solids	34.50	

Notes:

J: Estimated value

U: non detect value

mg/kg: Milligram per kilogram

DUP: Sample duplicate

N: Normal sample

MDL used for non-detect results, per data source

All data converted to mg/kg (except percent solids)

Table B4-1. Summary – Terrestrial Invertebrate and Vegetation Metals: August 2023

Sample Media	Analyte	Total Sample Number	Detect	Detection Frequency	Maximum Detected Concentration (mg/kg)	Minimum Detected Concentration (mg/kg)	Maximum Non-Detect MDL (mg/kg)	½ Maximum MDL if All Non-Detect (mg/kg)
Macroinvertebrates	Aluminum	13	3	23%	266.000	89.800	51.000	-
	Antimony	13	1	8%	0.581	0.581	2.440	-
	Arsenic	13	7	54%	5.440	0.991	0.983	-
	Barium	13	4	31%	46.800	8.220	5.010	-
	Beryllium	13	0	0%	-	-	2.040	1.020
	Cadmium	13	13	100%	4.430	0.236	-	-
	Chromium	13	12	92%	3.560	3.220	7.310	-
	Cobalt	13	6	46%	0.428	0.110	0.487	-
	Copper	13	13	100%	334.000	37.600	-	-
	Iron	13	11	85%	619.000	101.000	98.300	-
	Lead	13	13	100%	50.100	0.488	-	-
	Magnesium	13	13	100%	4,470.000	1,130.000	-	-
	Manganese	13	13	100%	87.500	10.000	-	-
	Mercury	13	1	8%	0.050	0.050	0.050	-
	Nickel	13	12	92%	3.190	0.511	0.497	-
	Potassium	13	13	100%	12,800.000	6,860.000	-	-
	Selenium	13	13	100%	9.640	2.480	-	-
	Silver	13	1	8%	5.370	5.370	0.510	-
	Sodium	13	13	100%	4,960.000	1,410.000	-	-
	Thallium	13	0	0%	-	-	4.870	2.435
	Vanadium	13	9	69%	3.450	2.010	9.740	-
	Zinc	13	13	100%	320.000	160.000	-	-
Vegetation	Aluminum	38	23	61%	331.000	48.300	51.600	-
	Antimony	38	3	8%	0.751	0.500	0.521	-
	Arsenic	38	8	21%	4.210	0.800	1.040	-
	Barium	38	24	63%	42.300	5.390	5.160	-
	Beryllium	38	0	0%	-	-	2.080	1.040
	Cadmium	38	22	58%	1.950	0.120	0.103	-
	Chromium	38	38	100%	3.910	1.520	-	-
	Cobalt	38	14	37%	0.325	0.079	0.103	-
	Copper	38	38	100%	16.800	2.430	-	-
	Iron	38	30	79%	714.000	87.250	103.000	-
	Lead	38	38	100%	10.900	0.106	-	-
	Magnesium	38	38	100%	7,560.000	752.000	-	-
	Manganese	38	38	100%	2,260.000	13.000	-	-
	Mercury	38	21	55%	0.040	0.010	0.010	-
	Nickel	38	30	79%	4.450	0.497	0.516	-
	Potassium	38	38	100%	64,500.000	8,990.000	-	-
	Selenium	38	27	71%	399.000	1.323	1.560	-
	Silver	38	0	0%	-	-	0.521	0.261
	Sodium	38	25	66%	18,800.000	325.000	260.000	-
	Thallium	38	0	0%	-	-	1.040	0.520
	Vanadium	38	2	5%	2.960	2.450	2.080	-

Table B4-1. Summary – Terrestrial Invertebrate and Vegetation Metals: August 2023

Sample Media	Analyte	Total Sample Number	Detect	Detection Frequency	Maximum Detected Concentration (mg/kg)	Minimum Detected Concentration (mg/kg)	Maximum Non-Detect MDL (mg/kg)	½ Maximum MDL if All Non-Detect (mg/kg)
	Zinc	38	32	84%	177.000	30.500	30.900	-

Notes:

MDL: Method detection limit

mg/kg: Milligram per kilogram

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Aluminum	49.00	U
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Antimony	0.49	U
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Arsenic	0.98	U
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Barium	4.90	U
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Beryllium	1.96	U
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Cadmium	0.32	
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Chromium	3.28	
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Cobalt	0.15	J
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Copper	61.00	
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Iron	170.00	J
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Lead	1.06	
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Magnesium	2,010.00	J
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Manganese	18.70	J
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Mercury	0.05	U
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Nickel	0.89	J
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Potassium	11,000.00	
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Selenium	2.64	J
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Silver	0.49	U
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Sodium	2,450.00	J
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Thallium	0.98	U
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Vanadium	2.92	J
DU-0003	Macroinvertebrates	DU0003-01_01_TER-TISINV	08/15/23	N	Zinc	222.00	
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Aluminum	114.00	
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Antimony	0.50	U
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Arsenic	0.99	U
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Barium	4.97	U
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Beryllium	1.99	U
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Cadmium	0.58	
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Chromium	1.52	J
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Cobalt	0.16	J
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Copper	9.86	
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Iron	323.00	
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Lead	2.30	
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Magnesium	3,130.00	
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Manganese	22.90	
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Mercury	0.01	U
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Nickel	1.27	
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Potassium	15,800.00	
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Selenium	1.72	J
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Silver	0.50	U
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Sodium	6,570.00	
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Thallium	0.99	U
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Vanadium	1.99	U
DU-0003	Vegetation	DU0003-01_01_VEG	08/15/23	N	Zinc	87.20	
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Aluminum	118.00	

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Antimony	0.50	U
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Arsenic	1.01	U
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Barium	5.03	U
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Beryllium	2.01	U
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Cadmium	0.10	U
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Chromium	2.13	
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Cobalt	0.12	J
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Copper	13.60	
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Iron	340.00	
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Lead	0.27	
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Magnesium	2,990.00	
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Manganese	26.20	
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Mercury	0.03	
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Nickel	0.85	J
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Potassium	21,700.00	
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Selenium	2.11	
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Silver	0.50	U
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Sodium	1,020.00	
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Thallium	1.01	U
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Vanadium	2.01	U
DU-0003	Vegetation	DU0003-02_01_VEG	08/15/23	N	Zinc	60.20	
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Aluminum	49.90	U
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Antimony	0.50	U
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Arsenic	1.00	U
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Barium	4.99	U
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Beryllium	2.00	U
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Cadmium	0.10	U
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Chromium	1.81	J
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Copper	3.34	
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Iron	99.80	U
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Lead	0.28	
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Magnesium	1,300.00	
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Manganese	27.90	
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Mercury	0.01	U
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Nickel	0.95	J
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Potassium	11,600.00	
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Selenium	1.50	U
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Silver	0.50	U
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Sodium	1,080.00	
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Thallium	1.00	U
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Vanadium	2.00	U
DU-0003	Vegetation	DU0003-03_01_VEG	08/15/23	N	Zinc	30.00	U
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Aluminum	48.70	U
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Antimony	0.49	U

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Arsenic	0.99	J
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Barium	4.87	U
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Beryllium	1.95	U
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Cadmium	0.54	
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Chromium	3.33	
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Cobalt	0.10	U
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Copper	37.60	
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Iron	101.00	J
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Lead	0.60	
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Magnesium	1,540.00	
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Manganese	31.20	
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Mercury	0.05	U
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Nickel	0.73	J
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Potassium	10,000.00	
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Selenium	2.78	J
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Silver	0.49	U
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Sodium	1,700.00	
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Thallium	0.97	U
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Vanadium	2.01	J
DU-0005	Macroinvertebrates	DU0005-01_01_TER-TISINV	08/15/23	N	Zinc	309.00	
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Aluminum	133.00	
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Antimony	0.50	U
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Arsenic	1.00	U
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Barium	6.60	J
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Beryllium	1.99	U
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Cadmium	0.75	
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Chromium	1.97	J
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Cobalt	0.13	J
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Copper	16.80	
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Iron	343.00	
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Lead	1.51	
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Magnesium	4,450.00	
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Manganese	21.70	
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Mercury	0.01	J
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Nickel	1.26	
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Potassium	31,200.00	
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Selenium	2.37	
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Silver	0.50	U
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Sodium	748.00	J
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Thallium	1.00	U
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Vanadium	1.99	U
DU-0005	Vegetation	DU0005-01_01_VEG	08/15/23	N	Zinc	177.00	
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Aluminum	75.20	J
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Antimony	0.49	U
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Arsenic	0.97	U

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Barium	4.85	U
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Beryllium	1.94	U
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Cadmium	0.10	U
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Chromium	1.72	J
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Copper	3.94	
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Iron	165.00	J
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Lead	0.11	J
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Magnesium	7,490.00	
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Manganese	43.80	
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Mercury	0.02	
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Nickel	0.49	U
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Potassium	15,200.00	
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Selenium	3.84	
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Silver	0.49	U
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Sodium	9,390.00	
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Thallium	0.97	U
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Vanadium	1.94	U
DU-0005	Vegetation	DU0005-02_01_VEG	08/15/23	N	Zinc	60.00	
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Aluminum	51.10	U
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Antimony	0.51	U
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Arsenic	1.02	U
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Barium	12.50	
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Beryllium	2.04	U
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Cadmium	0.10	U
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Chromium	1.95	J
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Copper	7.62	
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Iron	102.00	U
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Lead	0.46	
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Magnesium	2,630.00	
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Manganese	60.60	
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Mercury	0.03	
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Nickel	0.51	U
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Potassium	23,800.00	
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Selenium	2.18	
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Silver	0.51	U
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Sodium	797.00	J
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Thallium	1.02	U
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Vanadium	2.04	U
DU-0005	Vegetation	DU0005-03_01_VEG	08/15/23	N	Zinc	90.20	
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Aluminum	47.80	U
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Antimony	0.58	J
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Arsenic	0.96	U
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Barium	4.78	U

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Beryllium	1.91	U
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Cadmium	1.01	
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Chromium	3.30	
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Cobalt	0.10	U
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Copper	67.40	
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Iron	105.00	J
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Lead	0.74	
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Magnesium	1,360.00	
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Manganese	10.60	J
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Mercury	0.05	U
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Nickel	0.78	J
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Potassium	11,700.00	
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Selenium	6.67	
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Silver	0.48	U
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Sodium	1,430.00	
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Thallium	0.96	U
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Vanadium	1.91	U
DU-0009	Macroinvertebrates	DU0009-01_01_TER-TISINV	08/15/23	N	Zinc	173.00	
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Aluminum	50.20	U
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Antimony	0.50	U
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Arsenic	1.00	U
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Barium	5.02	U
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Beryllium	2.01	U
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Cadmium	0.78	
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Chromium	3.40	
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Copper	10.70	
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Iron	157.00	J
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Lead	0.84	
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Magnesium	6,420.00	
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Manganese	51.50	
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Mercury	0.01	U
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Nickel	1.33	
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Potassium	56,400.00	
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Selenium	5.84	
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Silver	0.50	U
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Sodium	4,470.00	
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Thallium	1.00	U
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Vanadium	2.01	U
DU-0009	Vegetation	DU0009-01_01_VEG	08/15/23	N	Zinc	74.30	
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Aluminum	53.40	J
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Antimony	0.75	J
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Arsenic	1.03	U
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Barium	5.13	U
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Beryllium	2.05	U

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Cadmium	0.63	
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Chromium	2.85	
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Copper	8.24	
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Iron	137.00	J
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Lead	1.12	
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Magnesium	3,790.00	
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Manganese	34.60	
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Mercury	0.01	J
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Nickel	1.33	
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Potassium	26,400.00	
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Selenium	3.95	
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Silver	0.51	U
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Sodium	2,180.00	
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Thallium	1.03	U
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Vanadium	2.05	U
DU-0009	Vegetation	DU0009-02_01_VEG	08/15/23	N	Zinc	47.00	
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Aluminum	118.00	
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Antimony	0.52	U
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Arsenic	1.04	U
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Barium	13.00	
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Beryllium	2.08	U
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Cadmium	0.52	
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Chromium	3.91	
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Cobalt	0.15	J
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Copper	4.48	
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Iron	273.00	
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Lead	3.39	
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Magnesium	1,110.00	
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Manganese	49.10	
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Mercury	0.04	
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Nickel	2.34	
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Potassium	12,500.00	
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Selenium	1.56	U
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Silver	0.52	U
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Sodium	260.00	U
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Thallium	1.04	U
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Vanadium	2.08	U
DU-0009	Vegetation	DU0009-03_01_VEG	08/15/23	N	Zinc	39.20	
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Aluminum	49.30	U
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Antimony	0.49	U
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Arsenic	1.09	J
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Barium	4.93	U
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Beryllium	1.97	U
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Cadmium	0.39	

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Chromium	3.42	
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Cobalt	0.10	U
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Copper	45.30	
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Iron	151.00	J
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Lead	1.16	
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Magnesium	1,400.00	
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Manganese	13.40	J
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Mercury	0.05	U
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Nickel	0.55	J
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Potassium	11,700.00	
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Selenium	2.48	J
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Silver	0.49	U
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Sodium	1,560.00	
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Thallium	0.99	U
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Vanadium	2.55	J
DU-0019	Macroinvertebrates	DU0019-01_01_TER-TISINV	08/14/23	N	Zinc	214.00	
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Aluminum	130.00	
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Antimony	0.49	U
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Arsenic	0.99	U
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Barium	7.43	J
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Beryllium	1.98	U
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Cadmium	1.05	
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Chromium	2.33	
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Cobalt	0.10	U
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Copper	13.10	
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Iron	315.00	
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Lead	2.23	
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Magnesium	4,550.00	
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Manganese	42.70	
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Mercury	0.04	
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Nickel	0.54	J
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Potassium	57,400.00	
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Selenium	1.48	U
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Silver	0.49	U
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Sodium	2,240.00	J
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Thallium	0.99	U
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Vanadium	1.98	U
DU-0019	Vegetation	DU0019-01_01_VEG	08/14/23	N	Zinc	148.00	
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Aluminum	102.00	
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Antimony	0.49	U
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Arsenic	0.99	U
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Barium	11.20	
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Beryllium	1.98	U
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Cadmium	0.10	U
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Chromium	2.96	

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Cobalt	0.10	U
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Copper	11.50	
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Iron	263.00	
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Lead	0.68	J
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Magnesium	2,610.00	
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Manganese	33.40	
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Mercury	0.02	
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Nickel	0.99	J
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Potassium	32,300.00	
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Selenium	1.48	U
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Silver	0.49	U
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Sodium	247.00	U
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Thallium	0.99	U
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Vanadium	1.98	U
DU-0019	Vegetation	DU0019-02_01_VEG	08/14/23	N	Zinc	40.00	
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Aluminum	56.60	J
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Antimony	0.50	J
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Arsenic	0.99	U
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Barium	15.70	
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Beryllium	1.98	U
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Cadmium	0.12	J
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Chromium	2.41	
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Cobalt	0.10	U
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Copper	4.35	
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Iron	129.00	J
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Lead	2.62	
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Magnesium	752.00	
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Manganese	16.50	
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Mercury	0.01	U
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Nickel	0.50	J
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Potassium	13,100.00	
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Selenium	1.49	U
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Silver	0.50	U
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Sodium	248.00	U
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Thallium	0.99	U
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Vanadium	1.98	U
DU-0019	Vegetation	DU0019-03_01_VEG	08/14/23	N	Zinc	31.60	
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Aluminum	48.30	U
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Antimony	0.48	U
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Arsenic	0.97	U
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Barium	4.83	U
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Beryllium	1.93	U
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Cadmium	0.24	
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Chromium	3.25	
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Cobalt	0.10	U

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Copper	48.20	
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Iron	96.60	U
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Lead	0.59	
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Magnesium	2,150.00	
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Manganese	10.00	J
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Mercury	0.05	U
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Nickel	1.00	
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Potassium	10,400.00	
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Selenium	5.78	
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Silver	0.48	U
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Sodium	2,420.00	
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Thallium	0.97	U
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Vanadium	2.16	J
DU-0038	Macroinvertebrates	DU0038-01_01_TER-TISINV	08/15/23	N	Zinc	160.00	
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Aluminum	49.70	U
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Antimony	0.50	U
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Arsenic	1.00	U
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Barium	9.90	J
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Beryllium	1.99	U
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Cadmium	0.59	
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Chromium	1.87	J
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Copper	13.00	
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Iron	147.00	J
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Lead	0.67	
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Magnesium	7,400.00	
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Manganese	28.00	
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Mercury	0.01	J
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Nickel	0.90	J
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Potassium	37,700.00	
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Selenium	7.14	
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Silver	0.50	U
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Sodium	14,700.00	
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Thallium	1.00	U
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Vanadium	1.99	U
DU-0038	Vegetation	DU0038-01_01_VEG	08/15/23	N	Zinc	155.00	
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Aluminum	59.20	J
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Antimony	0.51	U
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Arsenic	1.02	U
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Barium	5.10	U
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Beryllium	2.04	U
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Cadmium	0.10	U
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Chromium	2.14	
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Copper	10.30	

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Iron	128.00	J
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Lead	0.13	J
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Magnesium	3,350.00	
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Manganese	14.40	J
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Mercury	0.01	J
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Nickel	0.51	U
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Potassium	25,500.00	
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Selenium	1.84	J
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Silver	0.51	U
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Sodium	790.00	J
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Thallium	1.02	U
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Vanadium	2.04	U
DU-0038	Vegetation	DU0038-02_01_VEG	08/15/23	N	Zinc	51.80	
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Aluminum	49.20	U
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Antimony	0.49	U
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Arsenic	0.98	U
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Barium	6.46	J
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Beryllium	1.97	U
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Cadmium	0.34	
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Chromium	2.72	
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Copper	3.48	
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Iron	98.30	U
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Lead	0.26	
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Magnesium	1,080.00	
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Manganese	19.10	
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Mercury	0.01	U
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Nickel	1.54	
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Potassium	17,700.00	
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Selenium	1.48	U
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Silver	0.49	U
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Sodium	246.00	U
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Thallium	0.98	U
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Vanadium	1.97	U
DU-0038	Vegetation	DU0038-03_01_VEG	08/15/23	N	Zinc	29.50	U
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Aluminum	46.90	U
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Antimony	0.47	U
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Arsenic	0.94	U
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Barium	4.69	U
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Beryllium	1.88	U
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Cadmium	0.69	
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Chromium	3.34	
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Cobalt	0.09	U
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Copper	70.60	
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Iron	112.00	J

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Lead	0.50	
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Magnesium	1,580.00	
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Manganese	10.10	J
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Mercury	0.05	U
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Nickel	0.81	J
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Potassium	12,000.00	
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Selenium	4.78	
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Silver	0.47	U
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Sodium	2,090.00	
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Thallium	0.94	U
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Vanadium	1.88	U
DU-0047	Macroinvertebrates	DU0047-01_01_TER-TISINV	08/15/23	N	Zinc	163.00	
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Aluminum	74.10	J
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Antimony	0.50	U
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Arsenic	1.36	J
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Barium	4.96	U
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Beryllium	1.98	U
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Cadmium	0.48	
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Chromium	2.25	
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Cobalt	0.11	J
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Copper	11.40	
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Iron	228.00	J
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Lead	0.22	
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Magnesium	7,100.00	
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Manganese	22.10	
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Mercury	0.01	U
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Nickel	1.76	
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Potassium	41,100.00	
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Selenium	155.00	
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Silver	0.50	U
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Sodium	3,890.00	
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Thallium	0.99	U
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Vanadium	1.98	U
DU-0047	Vegetation	DU0047-01_01_VEG	08/15/23	N	Zinc	103.00	
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Aluminum	49.90	U
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Antimony	0.50	U
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Arsenic	1.00	U
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Barium	4.99	U
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Beryllium	2.00	U
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Cadmium	0.22	
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Chromium	2.24	
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Cobalt	0.11	J
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Copper	12.00	
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Iron	135.00	J
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Lead	0.23	

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Magnesium	2,510.00	
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Manganese	19.20	
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Mercury	0.01	U
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Nickel	1.53	
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Potassium	26,200.00	
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Selenium	3.62	
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Silver	0.50	U
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Sodium	250.00	U
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Thallium	1.00	U
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Vanadium	2.00	U
DU-0047	Vegetation	DU0047-02_01_VEG	08/15/23	N	Zinc	62.00	
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Aluminum	50.10	U
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Antimony	0.50	U
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Arsenic	1.00	U
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Barium	5.50	J
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Beryllium	2.00	U
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Cadmium	0.10	U
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Chromium	2.18	
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Copper	4.23	
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Iron	100.00	U
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Lead	0.29	
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Magnesium	1,010.00	
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Manganese	14.10	J
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Mercury	0.01	U
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Nickel	0.91	J
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Potassium	13,200.00	
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Selenium	1.50	U
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Silver	0.50	U
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Sodium	250.00	U
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Thallium	1.00	U
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Vanadium	2.00	U
DU-0047	Vegetation	DU0047-03_01_VEG	08/15/23	N	Zinc	30.50	
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Aluminum	51.00	U
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Antimony	0.51	U
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Arsenic	1.37	J
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Barium	10.70	
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Beryllium	2.04	U
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Cadmium	0.87	
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Chromium	3.35	
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Cobalt	0.11	J
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Copper	60.40	
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Iron	132.00	J
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Lead	3.34	
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Magnesium	1,630.00	

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Manganese	13.10	J
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Mercury	0.05	U
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Nickel	0.72	J
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Potassium	12,800.00	
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Selenium	5.13	
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Silver	0.51	U
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Sodium	1,500.00	
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Thallium	1.02	U
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Vanadium	3.03	J
DU-0085	Macroinvertebrates	DU0085-01_01_TER-TISINV	08/15/23	N	Zinc	162.00	
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Aluminum	54.80	J
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Antimony	0.48	U
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Arsenic	0.97	U
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Barium	35.90	
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Beryllium	1.93	U
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Cadmium	0.34	
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Chromium	2.11	
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Copper	9.31	
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Iron	152.00	J
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Lead	0.16	J
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Magnesium	7,560.00	
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Manganese	30.50	
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Mercury	0.02	
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Nickel	1.04	
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Potassium	43,300.00	
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Selenium	5.82	
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Silver	0.48	U
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Sodium	18,800.00	
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Thallium	0.97	U
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Vanadium	1.93	U
DU-0085	Vegetation	DU0085-01_01_VEG	08/15/23	N	Zinc	48.90	
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Aluminum	56.30	J
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Antimony	0.50	U
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Arsenic	1.01	U
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Barium	20.40	
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Beryllium	2.02	U
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Cadmium	0.10	U
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Chromium	2.32	
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Copper	2.43	
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Iron	109.00	J
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Lead	0.19	J
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Magnesium	3,240.00	
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Manganese	13.10	J

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Mercury	0.03	
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Nickel	0.70	J
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Potassium	18,700.00	
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Selenium	1.51	U
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Silver	0.50	U
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Sodium	329.00	J
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Thallium	1.01	U
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Vanadium	2.02	U
DU-0085	Vegetation	DU0085-02_01_VEG	08/15/23	N	Zinc	30.30	U
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Aluminum	101.00	J
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Antimony	0.51	U
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Arsenic	1.31	J
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Barium	11.50	
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Beryllium	2.04	U
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Cadmium	0.99	
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Chromium	3.56	
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Cobalt	0.22	
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Copper	75.80	
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Iron	268.00	
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Lead	3.81	
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Magnesium	1,670.00	
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Manganese	17.20	
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Mercury	0.05	U
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Nickel	1.21	
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Potassium	12,300.00	
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Selenium	3.64	
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Silver	0.51	U
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Sodium	1,590.00	
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Thallium	1.02	U
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Vanadium	2.95	J
DU-0085	Macroinvertebrates	DU0085-02_02_TER-TISINV	08/15/23	N	Zinc	165.00	
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Aluminum	49.60	U
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Antimony	0.50	U
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Arsenic	0.99	U
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Barium	15.30	
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Beryllium	1.98	U
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Cadmium	0.15	J
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Chromium	3.17	
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Copper	3.50	
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Iron	103.00	J
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Lead	0.44	
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Magnesium	898.00	
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Manganese	57.70	
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Mercury	0.01	U

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Nickel	0.50	U
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Potassium	24,000.00	
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Selenium	1.82	J
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Silver	0.50	U
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Sodium	248.00	U
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Thallium	0.99	U
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Vanadium	1.98	U
DU-0085	Vegetation	DU0085-03_01_VEG	08/15/23	N	Zinc	51.90	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Aluminum	266.00	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Antimony	0.49	U
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Arsenic	0.98	U
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Barium	8.22	J
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Beryllium	1.95	U
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Cadmium	0.26	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Chromium	3.33	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Cobalt	0.43	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Copper	45.80	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Iron	619.00	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Lead	0.91	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Magnesium	1,300.00	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Manganese	36.70	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Mercury	0.05	U
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Nickel	1.52	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Potassium	10,400.00	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Selenium	3.16	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Silver	0.49	U
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Sodium	1,460.00	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Thallium	0.98	U
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Vanadium	3.45	
DU-0096	Macroinvertebrates	DU0096-01_01_TER-TISINV	08/15/23	N	Zinc	195.00	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Aluminum	331.00	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Antimony	0.51	U
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Arsenic	1.90	J
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Barium	16.90	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Beryllium	2.02	U
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Cadmium	0.61	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Chromium	3.06	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Cobalt	0.33	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Copper	12.80	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Iron	714.00	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Lead	1.46	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Magnesium	4,330.00	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Manganese	47.20	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Mercury	0.01	J
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Nickel	1.69	

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Potassium	35,400.00	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Selenium	52.60	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Silver	0.51	U
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Sodium	1,780.00	
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Thallium	1.01	U
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Vanadium	2.45	J
DU-0096	Vegetation	DU0096-01_01_VEG	08/15/23	N	Zinc	103.00	
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Aluminum	78.70	J
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Antimony	0.49	U
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Arsenic	0.98	U
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Barium	15.70	
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Beryllium	1.96	U
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Cadmium	0.67	
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Chromium	3.24	
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Cobalt	0.15	J
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Copper	5.38	
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Iron	182.00	J
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Lead	0.61	
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Magnesium	3,980.00	
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Manganese	73.90	
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Mercury	0.01	U
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Nickel	1.06	
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Potassium	14,100.00	
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Selenium	2.67	
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Silver	0.49	U
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Sodium	471.00	J
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Thallium	0.98	U
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Vanadium	1.96	U
DU-0096	Vegetation	DU0096-02_01_VEG	08/15/23	N	Zinc	87.20	
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Aluminum	297.00	
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Antimony	0.51	U
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Arsenic	1.21	J
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Barium	9.50	J
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Beryllium	2.02	U
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Cadmium	0.14	J
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Chromium	3.05	
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Cobalt	0.24	
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Copper	3.43	
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Iron	655.00	
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Lead	1.21	
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Magnesium	1,300.00	
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Manganese	42.20	
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Mercury	0.01	U
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Nickel	1.30	
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Potassium	15,600.00	

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Selenium	2.19	
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Silver	0.51	U
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Sodium	1,830.00	J
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Thallium	1.01	U
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Vanadium	2.96	J
DU-0096	Vegetation	DU0096-03_01_VEG	08/15/23	N	Zinc	32.50	
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Aluminum	49.10	U
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Antimony	0.49	U
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Arsenic	0.98	U
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Barium	4.91	U
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Beryllium	1.97	U
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Cadmium	0.59	
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Chromium	3.39	
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Cobalt	0.16	J
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Copper	53.60	
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Iron	98.30	U
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Lead	0.49	
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Magnesium	1,540.00	
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Manganese	87.50	
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Mercury	0.05	U
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Nickel	1.21	
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Potassium	11,200.00	
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Selenium	9.64	
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Silver	0.49	U
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Sodium	1,440.00	
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Thallium	0.98	U
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Vanadium	2.69	J
DU-0109	Macroinvertebrates	DU0109-01_01_TER-TISINV	08/15/23	N	Zinc	185.00	
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Aluminum	90.40	J
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Antimony	0.51	U
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Arsenic	4.21	
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Barium	13.70	
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Beryllium	2.05	U
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Cadmium	0.67	
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Chromium	3.30	
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Cobalt	0.13	J
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Copper	5.75	
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Iron	248.00	J
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Lead	1.58	
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Magnesium	5,340.00	
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Manganese	31.10	
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Mercury	0.02	
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Nickel	1.31	
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Potassium	33,200.00	
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Selenium	399.00	

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Silver	0.51	U
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Sodium	9,640.00	
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Thallium	1.03	U
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Vanadium	2.05	U
DU-0109	Vegetation	DU0109-01_01_VEG	08/15/23	N	Zinc	65.30	
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Aluminum	48.90	U
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Antimony	0.49	U
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Arsenic	0.98	U
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Barium	7.35	J
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Beryllium	1.96	U
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Cadmium	0.54	
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Chromium	3.17	
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Cobalt	0.15	J
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Copper	6.95	
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Iron	97.90	U
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Lead	1.62	
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Magnesium	2,540.00	
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Manganese	23.10	
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Mercury	0.01	J
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Nickel	4.45	
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Potassium	27,600.00	
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Selenium	10.50	
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Silver	0.49	U
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Sodium	245.00	U
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Thallium	0.98	U
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Vanadium	1.96	U
DU-0109	Vegetation	DU0109-02_01_VEG	08/15/23	N	Zinc	35.40	
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Aluminum	48.50	U
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Antimony	0.49	U
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Arsenic	0.97	U
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Barium	4.85	U
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Beryllium	1.94	U
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Cadmium	0.10	U
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Chromium	3.14	
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Copper	5.24	
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Iron	106.00	J
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Lead	0.67	
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Magnesium	1,660.00	
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Manganese	18.40	
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Mercury	0.01	U
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Nickel	0.49	U
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Potassium	12,200.00	
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Selenium	1.75	J
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Silver	0.49	U

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Sodium	242.00	U
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Thallium	0.97	U
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Vanadium	1.94	U
DU-0109	Vegetation	DU0109-03_01_VEG	08/15/23	N	Zinc	43.10	
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Aluminum	51.30	U
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Antimony	0.51	U
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Arsenic	1.03	U
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Barium	5.39	J
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Beryllium	2.05	U
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Cadmium	0.10	U
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Chromium	2.65	
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Copper	3.29	
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Iron	103.00	U
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Lead	0.25	
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Magnesium	2,990.00	
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Manganese	2,260.00	
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Mercury	0.01	J
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Nickel	0.93	J
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Potassium	21,800.00	
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Selenium	4.15	
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Silver	0.51	U
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Sodium	460.00	J
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Thallium	1.03	U
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Vanadium	2.05	U
DU-0109	Vegetation	DU0109-04_01_VEG	08/15/23	N	Zinc	30.80	U
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Aluminum	50.10	U
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Antimony	0.50	U
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Arsenic	1.08	J
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Barium	5.01	U
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Beryllium	2.00	U
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Cadmium	0.33	
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Chromium	3.22	
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Cobalt	0.11	J
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Copper	49.20	
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Iron	151.00	J
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Lead	1.04	
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Magnesium	1,130.00	
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Manganese	13.90	J
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Mercury	0.05	U
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Nickel	0.51	J
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Potassium	11,000.00	
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Selenium	3.33	
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Silver	0.50	U
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Sodium	1,410.00	

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Thallium	1.00	U
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Vanadium	2.59	J
DU-0122	Macroinvertebrates	DU0122-01_01_TER-TISINV	08/15/23	N	Zinc	176.00	
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Aluminum	123.00	
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Antimony	0.47	U
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Arsenic	1.10	J
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Barium	11.60	
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Beryllium	1.88	U
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Cadmium	0.63	
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Chromium	1.85	J
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Cobalt	0.13	J
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Copper	11.90	
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Iron	251.00	
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Lead	2.32	
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Magnesium	2,130.00	
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Manganese	20.10	
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Mercury	0.01	U
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Nickel	1.10	
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Potassium	25,000.00	
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Selenium	92.90	
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Silver	0.47	U
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Sodium	235.00	U
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Thallium	0.94	U
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Vanadium	1.88	U
DU-0122	Vegetation	DU0122-01_01_VEG	08/15/23	N	Zinc	99.80	
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Aluminum	50.00	U
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Antimony	0.50	U
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Arsenic	1.00	U
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Barium	73.00	
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Beryllium	2.00	U
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Cadmium	0.87	
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Chromium	2.81	
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Cobalt	0.10	U
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Copper	8.52	
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Iron	102.00	J
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Lead	0.85	
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Magnesium	6,840.00	
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Manganese	26.80	
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Mercury	0.01	U
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Nickel	1.40	
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Potassium	42,100.00	
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Selenium	5.40	
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Silver	0.50	U
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Sodium	17,700.00	
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Thallium	1.00	U

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Vanadium	2.00	U
DU-0122	Vegetation	DUP-0122-01_02_VEG	08/15/23	FD	Zinc	55.70	
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Aluminum	49.10	U
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Antimony	0.49	U
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Arsenic	0.98	U
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Barium	9.00	J
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Beryllium	1.96	U
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Cadmium	0.32	
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Chromium	2.24	
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Copper	4.76	
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Iron	98.10	U
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Lead	0.21	
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Magnesium	1,690.00	
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Manganese	42.10	
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Mercury	0.01	U
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Nickel	0.52	J
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Potassium	9,210.00	
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Selenium	1.92	J
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Silver	0.49	U
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Sodium	245.00	U
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Thallium	0.98	U
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Vanadium	1.96	U
DU-0122	Vegetation	DU0122-02_01_VEG	08/15/23	N	Zinc	85.70	
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Aluminum	90.30	J
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Antimony	0.50	U
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Arsenic	1.15	J
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Barium	27.00	
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Beryllium	1.99	U
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Cadmium	0.27	
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Chromium	3.41	
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Cobalt	0.11	J
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Copper	7.43	
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Iron	214.00	J
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Lead	1.22	
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Magnesium	2,470.00	
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Manganese	31.20	
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Mercury	0.02	
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Nickel	2.14	
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Potassium	23,100.00	
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Selenium	24.60	
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Silver	0.50	U
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Sodium	248.00	U
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Thallium	0.99	U
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Vanadium	1.99	U

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0122	Vegetation	DUP-0122-02_02_VEG	08/15/23	FD	Zinc	29.80	U
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Aluminum	48.30	U
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Antimony	0.48	U
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Arsenic	0.97	U
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Barium	16.10	
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Beryllium	1.93	U
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Cadmium	0.10	U
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Chromium	2.57	
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Cobalt	0.10	U
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Copper	6.14	
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Iron	125.00	J
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Lead	0.69	
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Magnesium	1,900.00	
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Manganese	37.50	
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Mercury	0.01	U
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Nickel	0.57	J
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Potassium	28,200.00	
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Selenium	1.45	U
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Silver	0.48	U
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Sodium	242.00	U
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Thallium	0.97	U
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Vanadium	1.93	U
DU-0122	Vegetation	DU0122-03_01_VEG	08/15/23	N	Zinc	39.60	
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Aluminum	49.50	U
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Antimony	0.50	U
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Arsenic	0.99	U
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Barium	12.70	
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Beryllium	1.98	U
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Cadmium	0.10	U
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Chromium	2.58	
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Cobalt	0.10	U
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Copper	3.88	
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Iron	99.00	U
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Lead	0.38	
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Magnesium	1,170.00	
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Manganese	46.10	
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Mercury	0.01	U
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Nickel	0.55	J
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Potassium	23,200.00	
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Selenium	1.92	J
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Silver	0.50	U
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Sodium	248.00	U
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Thallium	0.99	U
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Vanadium	1.98	U
DU-0122	Vegetation	DUP-0122-03_02_VEG	08/15/23	FD	Zinc	45.40	

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Aluminum	89.80	J
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Antimony	2.44	U
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Arsenic	5.44	J
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Barium	46.80	J
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Beryllium	1.95	U
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Cadmium	4.43	
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Chromium	7.31	U
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Cobalt	0.49	U
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Copper	334.00	
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Iron	282.00	
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Lead	50.10	
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Magnesium	4,470.00	
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Manganese	39.90	
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Mercury	0.05	J
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Nickel	3.19	J
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Potassium	6,860.00	
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Selenium	7.51	J
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Silver	5.37	
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Sodium	4,960.00	
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Thallium	4.87	U
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Vanadium	9.74	U
DU-0128	Macroinvertebrates	DU0128-01_01_TER-TISINV	08/14/23	N	Zinc	320.00	
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Aluminum	51.30	J
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Antimony	0.51	U
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Arsenic	1.32	J
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Barium	5.12	U
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Beryllium	2.05	U
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Cadmium	1.95	
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Chromium	3.35	
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Cobalt	0.10	U
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Copper	9.83	
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Iron	149.00	J
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Lead	10.90	
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Magnesium	6,610.00	
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Manganese	25.90	
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Mercury	0.01	U
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Nickel	0.51	U
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Potassium	29,400.00	
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Selenium	1.54	U
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Silver	0.51	U
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Sodium	2,260.00	
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Thallium	1.02	U
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Vanadium	2.05	U
DU-0128	Vegetation	DU0128-01_01_VEG	08/14/23	N	Zinc	162.00	
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Aluminum	48.30	J

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Antimony	0.48	U
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Arsenic	0.96	U
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Barium	4.82	U
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Beryllium	1.93	U
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Cadmium	0.10	U
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Chromium	3.42	
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Cobalt	0.10	U
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Copper	6.58	
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Iron	119.00	J
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Lead	1.90	
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Magnesium	3,060.00	
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Manganese	15.10	
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Mercury	0.02	
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Nickel	0.61	J
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Potassium	15,500.00	
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Selenium	1.44	U
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Silver	0.48	U
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Sodium	983.00	
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Thallium	0.96	U
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Vanadium	1.93	U
DU-0128	Vegetation	DU0128-02_01_VEG	08/14/23	N	Zinc	37.00	
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Aluminum	46.90	U
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Antimony	0.47	U
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Arsenic	1.60	J
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Barium	4.69	U
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Beryllium	1.88	U
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Cadmium	0.09	U
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Chromium	3.16	
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Cobalt	0.09	U
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Copper	2.85	
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Iron	93.80	U
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Lead	6.82	
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Magnesium	1,500.00	
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Manganese	14.60	
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Mercury	0.01	U
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Nickel	0.47	U
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Potassium	8,990.00	
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Selenium	1.41	U
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Silver	0.47	U
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Sodium	583.00	J
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Thallium	0.94	U
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Vanadium	1.88	U
DU-0128	Vegetation	DU0128-03_01_VEG	08/14/23	N	Zinc	28.10	U
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Aluminum	51.60	U
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Antimony	0.63	J

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Arsenic	1.03	U
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Barium	5.16	U
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Beryllium	2.06	U
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Cadmium	0.10	U
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Chromium	2.20	
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Cobalt	0.10	U
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Copper	3.44	
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Iron	103.00	U
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Lead	0.29	
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Magnesium	1,700.00	
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Manganese	156.00	
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Mercury	0.01	U
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Nickel	0.52	U
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Potassium	29,500.00	
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Selenium	4.76	
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Silver	0.52	U
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Sodium	3,970.00	
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Thallium	1.03	U
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Vanadium	2.06	U
DU-0128	Vegetation	DU0128-04_01_VEG	08/14/23	N	Zinc	56.20	
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Aluminum	49.70	U
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Antimony	0.50	U
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Arsenic	1.33	J
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Barium	4.97	U
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Beryllium	1.99	U
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Cadmium	0.63	
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Chromium	3.37	
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Cobalt	0.10	U
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Copper	48.90	
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Iron	147.00	J
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Lead	5.35	
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Magnesium	1,350.00	
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Manganese	13.30	J
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Mercury	0.05	U
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Nickel	0.50	U
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Potassium	10,500.00	
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Selenium	6.03	
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Silver	0.50	U
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Sodium	1,420.00	
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Thallium	0.99	U
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Vanadium	1.99	U
DU-0131	Macroinvertebrates	DU0131-01_01_TER-TISINV	08/14/23	N	Zinc	191.00	
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Aluminum	67.80	J
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Antimony	0.51	U
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Arsenic	1.02	U

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Barium	15.90	
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Beryllium	2.05	U
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Cadmium	1.02	
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Chromium	2.48	
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Cobalt	0.10	U
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Copper	7.38	
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Iron	201.00	J
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Lead	4.49	
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Magnesium	4,650.00	
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Manganese	48.20	
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Mercury	0.01	J
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Nickel	0.84	J
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Potassium	64,500.00	
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Selenium	2.65	
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Silver	0.51	U
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Sodium	325.00	J
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Thallium	1.02	U
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Vanadium	2.05	U
DU-0131	Vegetation	DU0131-01_01_VEG	08/14/23	N	Zinc	71.00	
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Aluminum	128.00	
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Antimony	0.50	U
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Arsenic	1.01	U
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Barium	10.20	
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Beryllium	2.02	U
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Cadmium	0.10	U
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Chromium	3.58	
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Cobalt	0.10	J
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Copper	12.30	
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Iron	334.00	
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Lead	3.23	
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Magnesium	2,620.00	
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Manganese	76.50	
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Mercury	0.01	J
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Nickel	1.26	
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Potassium	40,500.00	
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Selenium	1.68	J
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Silver	0.50	U
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Sodium	252.00	U
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Thallium	1.01	U
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Vanadium	2.02	U
DU-0131	Vegetation	DU0131-02_01_VEG	08/14/23	N	Zinc	37.80	
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Aluminum	51.50	U
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Antimony	0.52	U
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Arsenic	1.03	U
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Barium	12.10	

Table B4-2. Terrestrial Invertebrate and Vegetation Metals: August 2023

Location	Sample Media	Sample Name	Sample Date	Samp Type	Analyte	Result (mg/kg dry)	Qualifier
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Beryllium	2.06	U
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Cadmium	0.10	U
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Chromium	2.86	
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Cobalt	0.10	U
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Copper	3.83	
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Iron	114.00	J
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Lead	2.88	
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Magnesium	970.00	
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Manganese	13.00	J
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Mercury	0.02	
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Nickel	0.92	J
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Potassium	14,100.00	
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Selenium	3.12	
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Silver	0.52	U
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Sodium	258.00	U
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Thallium	1.03	U
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Vanadium	2.06	U
DU-0131	Vegetation	DU0131-03_01_VEG	08/14/23	N	Zinc	30.90	U

Notes:

J: Estimated value

U: non detect value

MDL: Method detection limit

mg/kg: Milligram per kilogram

FD:Field duplicate

N: Normal sample

MDL used for non-detect results, per data source

All data converted to mg/kg (except percent solids)

Appendix C – Soil, Surface Water, Sediment and Pore Water COPEC Screening

Table C-1. COPEC Identification for Surface Water - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
Metals	Aluminum	7429-90-5	79%	714.500	47.075	87.00	Y	N	Y	Y	8.21	**COPEC**
Metals	Antimony	7440-36-0	14%	0.165	1.105	190.00	Y	N	Y	N	0.00	Not a COPEC
Metals	Arsenic	7440-38-2	86%	1.440	0.774	0.02	Y	N	Y	Y	72.00	**COPEC**
Metals	Barium	7440-39-3	96%	67.200	1.453	220.00	Y	N	Y	N	0.31	Not a COPEC
Metals	Beryllium	7440-41-7	0%	-	1.147	3.60	Y	N	N	-	-	Not a COPEC
Metals	Cadmium	7440-43-9	0%	-	0.460	1.21	Y	N	N	-	-	Not a COPEC
Metals	Chromium	7440-47-3	14%	0.820	2.545	130.75	Y	N	Y	N	0.01	Not a COPEC
Metals	Cobalt	7440-48-4	14%	0.170	0.646	19.00	Y	N	Y	N	0.01	Not a COPEC
Metals	Copper	7440-50-8	29%	4.310	2.595	16.19	Y	N	Y	N	0.27	Not a COPEC
Metals	Iron	7439-89-6	86%	438.500	28.920	1,000.00	Y	N	Y	N	0.44	Not a COPEC
Metals	Lead	7439-92-1	68%	3.340	0.332	5.31	Y	N	Y	N	0.63	Not a COPEC
Metals	Manganese	7439-96-5	96%	110.000	1.336	2,078.02	Y	N	Y	N	0.05	Not a COPEC
Metals	Mercury	7439-97-6	86%	0.004	0.004	0.01	Y	Y	Y	N	0.44	**COPEC**
Metals	Nickel	7440-02-0	21%	2.700	3.033	100.00	Y	N	Y	N	0.03	Not a COPEC
Metals	Selenium	7782-49-2	96%	35.700	1.256	17.10	Y	Y	Y	Y	2.09	**COPEC**
Metals	Silver	7440-22-4	0%	-	0.460	1.05	Y	N	N	-	-	Not a COPEC
Metals	Thallium	7440-28-0	0%	-	0.834	6.00	Y	N	N	-	-	Not a COPEC
Metals	Vanadium	7440-62-2	57%	3.900	1.724	27.00	Y	N	Y	N	0.14	Not a COPEC
Metals	Zinc	7440-66-6	21%	10.150	13.931	227.62	Y	N	Y	N	0.04	Not a COPEC
Metals, Diss	Aluminum	7429-90-5	21%	490.000	47.075	87.00	Y	N	Y	Y	5.63	**COPEC**
Metals, Diss	Antimony	7440-36-0	14%	0.188	1.105	190.00	Y	N	Y	N	0.00	Not a COPEC
Metals, Diss	Arsenic	7440-38-2	86%	1.460	0.774	0.02	Y	N	Y	Y	73.00	**COPEC**
Metals, Diss	Barium	7440-39-3	96%	67.200	1.453	220.00	Y	N	Y	N	0.31	Not a COPEC
Metals, Diss	Beryllium	7440-41-7	0%	-	1.156	3.60	Y	N	N	-	-	Not a COPEC
Metals, Diss	Cadmium	7440-43-9	0%	-	0.460	1.21	Y	N	N	-	-	Not a COPEC
Metals, Diss	Chromium	7440-47-3	18%	1.590	2.545	130.75	Y	N	Y	N	0.01	Not a COPEC
Metals, Diss	Cobalt	7440-48-4	18%	0.940	0.646	19.00	Y	N	Y	N	0.05	Not a COPEC
Metals, Diss	Copper	7440-50-8	25%	2.450	2.595	16.19	Y	N	Y	N	0.15	Not a COPEC

Table C-1. COPEC Identification for Surface Water - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
Metals, Diss	Iron	7439-89-6	18%	384.000	28.920	1,000.00	Y	N	Y	N	0.38	Not a COPEC
Metals, Diss	Lead	7439-92-1	11%	3.210	0.332	5.31	Y	N	Y	N	0.61	Not a COPEC
Metals, Diss	Manganese	7439-96-5	96%	75.300	1.336	2,078.02	Y	N	Y	N	0.04	Not a COPEC
Metals, Diss	Mercury	7439-97-6	64%	0.001	0.004	0.01	Y	Y	Y	N	0.05	**COPEC**
Metals, Diss	Nickel	7440-02-0	25%	3.000	3.033	93.48	Y	N	Y	N	0.03	Not a COPEC
Metals, Diss	Selenium	7782-49-2	96%	35.200	1.256	17.10	Y	Y	Y	Y	2.06	**COPEC**
Metals, Diss	Silver	7440-22-4	0%	-	0.460	1.05	Y	N	N	-	-	Not a COPEC
Metals, Diss	Thallium	7440-28-0	0%	-	0.834	6.00	Y	N	N	-	-	Not a COPEC
Metals, Diss	Vanadium	7440-62-2	18%	2.920	1.724	27.00	Y	N	Y	N	0.11	Not a COPEC
Metals, Diss	Zinc	7440-66-6	14%	19.800	13.931	227.62	Y	N	Y	N	0.09	Not a COPEC
SVOCs	Acenaphthene	83-32-9	4%	0.270	0.020	520.00	Y	N	N	N	-	Not a COPEC
SVOCs	Acenaphthylene	208-96-8	4%	0.270	0.024	13.00	Y	N	N	N	-	Not a COPEC
SVOCs	Acetophenone	98-86-2	0%	-	1.326	-	N	N	N	-	-	Not a COPEC
SVOCs	Anthracene	120-12-7	4%	0.530	0.024	-	N	N	N	-	-	Not a COPEC
SVOCs	Atrazine	1912-24-9	0%	-	1.253	5.00	Y	N	N	-	-	Not a COPEC
SVOCs	Benzaldehyde	100-52-7	0%	-	1.066	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzo(a)anthracene	56-55-3	4%	0.320	0.018	4.70	Y	N	N	N	-	Not a COPEC
SVOCs	Benzo(a)pyrene	50-32-8	4%	0.260	0.032	0.06	Y	N	N	Y	-	Not a COPEC
SVOCs	Benzo(b)fluoranthene	205-99-2	4%	0.270	0.018	2.60	Y	N	N	N	-	Not a COPEC
SVOCs	Benzo(g,h,i)perylene	191-24-2	4%	0.190	0.024	0.01	Y	N	N	Y	-	**Source of Uncertainty**
SVOCs	Benzo(k)fluoranthene	207-08-9	4%	0.240	0.021	0.06	Y	N	N	Y	-	Not a COPEC
SVOCs	1,1'-Biphenyl	92-52-4	0%	-	1.036	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Bromophenyl-phenylether	101-55-3	0%	-	1.012	-	N	N	N	-	-	Not a COPEC
SVOCs	Butylbenzylphthalate	85-68-7	0%	-	0.902	-	N	N	N	-	-	Not a COPEC
SVOCs	Caprolactam	105-60-2	0%	-	1.902	-	N	N	N	-	-	Not a COPEC
SVOCs	Carbazole	86-74-8	0%	-	1.148	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chloroaniline	106-47-8	0%	-	1.299	-	N	N	N	-	-	Not a COPEC
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	0%	-	0.924	-	N	N	N	-	-	Not a COPEC

Table C-1. COPEC Identification for Surface Water - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	Bis(2-Chloroethyl) ether	111-44-4	0%	-	1.125	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chloro-3-methylphenol	59-50-7	0%	-	1.094	30.00	Y	N	N	-	-	Not a COPEC
SVOCs	2-Chloronaphthalene	91-58-7	0%	-	1.053	620.00	Y	N	N	-	-	Not a COPEC
SVOCs	2-Chlorophenol	95-57-8	0%	-	1.006	2,000.00	Y	N	N	-	-	Not a COPEC
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	0%	-	0.979	-	N	N	N	-	-	Not a COPEC
SVOCs	Chrysene	218-01-9	4%	0.280	0.020	4.70	Y	N	N	N	-	Not a COPEC
SVOCs	Dibenzo(a,h)anthracene	53-70-3	4%	0.180	0.021	0.01	Y	N	N	Y	-	**Source of Uncertainty**
SVOCs	Dibenzofuran	132-64-9	0%	-	1.054	-	N	N	N	-	-	Not a COPEC
SVOCs	3,3'-Dichlorobenzidine	91-94-1	0%	-	1.360	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dichlorophenol	120-83-2	0%	-	0.985	365.00	Y	N	N	-	-	Not a COPEC
SVOCs	Diethylphthalate	84-66-2	0%	-	0.834	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dimethylphenol	105-67-9	0%	-	1.114	2,120.00	Y	N	N	-	-	Not a COPEC
SVOCs	Dimethylphthalate	131-11-3	21%	2.600	0.923	1,100.00	Y	N	Y	N	0.00	Not a COPEC
SVOCs	Di-n-butylphthalate	84-74-2	0%	-	0.719	-	N	N	N	-	-	Not a COPEC
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	0%	-	1.619	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dinitrophenol	51-28-5	0%	-	1.776	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dinitrotoluene	121-14-2	0%	-	1.061	-	N	N	N	-	-	Not a COPEC
SVOCs	2,6-Dinitrotoluene	606-20-2	0%	-	1.006	230.00	Y	N	N	-	-	Not a COPEC
SVOCs	Di-n-octylphthalate	117-84-0	0%	-	0.776	-	N	N	N	-	-	Not a COPEC
SVOCs	1,4-Dioxane	123-91-1	0%	-	0.649	-	N	N	N	-	-	Not a COPEC
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	0%	-	0.990	-	N	N	N	-	-	Not a COPEC
SVOCs	Fluoranthene	206-44-0	25%	0.500	0.023	0.80	Y	N	Y	N	0.63	Not a COPEC
SVOCs	Fluorene	86-73-7	4%	0.470	0.019	-	N	N	N	-	-	Not a COPEC
SVOCs	Hexachlorobenzene	118-74-1	0%	-	0.879	-	N	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorobutadiene	87-68-3	0%	-	0.982	-	N	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	0%	-	2.301	-	N	N	N	-	-	Not a COPEC
SVOCs	Hexachloroethane	67-72-1	0%	-	0.875	-	N	N	N	-	-	Not a COPEC
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	4%	0.190	0.024	0.01	Y	N	N	Y	-	**Source of Uncertainty**

Table C-1. COPEC Identification for Surface Water - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	Isophorone	78-59-1	0%	-	0.886	-	N	N	N	-	-	Not a COPEC
SVOCs	1-Methylnaphthalene	90-12-0	6%	0.260	0.018	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	2-Methylnaphthalene	91-57-6	11%	0.390	0.020	4.70	Y	N	Y	N	0.08	Not a COPEC
SVOCs	2-Methylphenol	95-48-7	0%	-	1.076	-	N	N	N	-	-	Not a COPEC
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	0%	-	0.600	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Methylphenol	106-44-5	0%	-	1.021	53.00	Y	N	N	-	-	Not a COPEC
SVOCs	Naphthalene	91-20-3	11%	0.290	0.022	620.00	Y	N	Y	N	0.00	Not a COPEC
SVOCs	2-Nitroaniline	88-74-4	0%	-	1.361	-	N	N	N	-	-	Not a COPEC
SVOCs	3-Nitroaniline	99-09-2	0%	-	1.122	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Nitroaniline	100-01-6	0%	-	1.346	-	N	N	N	-	-	Not a COPEC
SVOCs	Nitrobenzene	98-95-3	0%	-	1.190	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Nitrophenol	88-75-5	0%	-	1.118	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Nitrophenol	100-02-7	0%	-	1.339	-	N	N	N	-	-	Not a COPEC
SVOCs	N-Nitroso-di-n propylamine	621-64-7	0%	-	1.163	-	N	N	N	-	-	Not a COPEC
SVOCs	N-Nitrosodiphenylamine	86-30-6	0%	-	1.044	-	N	N	N	-	-	Not a COPEC
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	0%	-	1.507	-	N	N	N	-	-	Not a COPEC
SVOCs	Pentachlorophenol	87-86-5	4%	0.210	0.071	15.00	Y	Y	N	N	-	Not a COPEC
SVOCs	Phenanthrene	85-01-8	21%	0.470	0.023	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Phenol	108-95-2	7%	1.200	1.234	2,560.00	Y	N	Y	N	0.00	Not a COPEC
SVOCs	Pyrene	129-00-0	4%	0.570	0.025	-	N	N	N	-	-	Not a COPEC
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	4%	1.100	1.122	-	N	N	N	-	-	Not a COPEC
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	0%	-	0.966	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4,5-Trichlorophenol	95-95-4	0%	-	1.049	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4,6-Trichlorophenol	88-06-2	0%	-	1.128	970.00	Y	N	N	-	-	Not a COPEC
VOCs	Acetone	67-64-1	7%	6.800	2.531	1,700.00	Y	N	Y	N	0.00	Not a COPEC
VOCs	Benzene	71-43-2	0%	-	0.332	-	N	N	N	-	-	Not a COPEC
VOCs	Bromochloromethane	74-97-5	0%	-	0.352	-	N	N	N	-	-	Not a COPEC
VOCs	Bromodichloromethane	75-27-4	0%	-	0.395	-	N	N	N	-	-	Not a COPEC

Table C-1. COPEC Identification for Surface Water - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
VOCs	Bromoform	75-25-2	0%	-	0.669	-	N	N	N	-	-	Not a COPEC
VOCs	Bromomethane	74-83-9	0%	-	0.678	-	N	N	N	-	-	Not a COPEC
VOCs	2-Butanone	78-93-3	0%	-	2.049	-	N	N	N	-	-	Not a COPEC
VOCs	Carbon disulfide	75-15-0	0%	-	0.483	15.00	Y	N	N	-	-	Not a COPEC
VOCs	Carbon tetrachloride	56-23-5	0%	-	0.385	-	N	N	N	-	-	Not a COPEC
VOCs	Chlorobenzene	108-90-7	0%	-	0.286	-	N	N	N	-	-	Not a COPEC
VOCs	Chloroethane	75-00-3	0%	-	0.402	-	N	N	N	-	-	Not a COPEC
VOCs	Chloroform	67-66-3	11%	1.300	0.953	1,240.00	Y	N	Y	N	0.00	Not a COPEC
VOCs	Chloromethane	74-87-3	0%	-	0.711	-	N	N	N	-	-	Not a COPEC
VOCs	Cyclohexane	110-82-7	0%	-	0.356	-	N	N	N	-	-	Not a COPEC
VOCs	Dibromochloromethane	124-48-1	0%	-	0.417	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	0%	-	0.769	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromoethane	106-93-4	0%	-	0.479	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichlorobenzene	95-50-1	0%	-	0.470	-	N	N	N	-	-	Not a COPEC
VOCs	1,3-Dichlorobenzene	541-73-1	0%	-	0.358	22.00	Y	N	N	-	-	Not a COPEC
VOCs	1,4-Dichlorobenzene	106-46-7	0%	-	0.336	-	N	N	N	-	-	Not a COPEC
VOCs	Dichlorodifluoromethane	75-71-8	0%	-	0.345	-	N	N	N	-	-	Not a COPEC
VOCs	1,1-Dichloroethane	75-34-3	0%	-	0.356	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloroethane	107-06-2	0%	-	0.447	20,000.00	Y	N	N	-	-	Not a COPEC
VOCs	1,1-Dichloroethene	75-35-4	0%	-	0.500	-	N	N	N	-	-	Not a COPEC
VOCs	cis-1,2-Dichloroethene	156-59-2	0%	-	0.398	-	N	N	N	-	-	Not a COPEC
VOCs	trans-1,2-Dichloroethene	156-60-5	0%	-	0.327	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloropropane	78-87-5	0%	-	0.337	-	N	N	N	-	-	Not a COPEC
VOCs	cis-1,3-Dichloropropene	10061-01-5	0%	-	0.361	-	N	N	N	-	-	Not a COPEC
VOCs	trans-1,3-Dichloropropene	10061-02-6	0%	-	0.412	-	N	N	N	-	-	Not a COPEC
VOCs	Ethylbenzene	100-41-4	0%	-	0.306	-	N	N	N	-	-	Not a COPEC
VOCs	2-Hexanone	591-78-6	0%	-	3.393	-	N	N	N	-	-	Not a COPEC
VOCs	Isopropylbenzene	98-82-8	0%	-	0.333	-	N	N	N	-	-	Not a COPEC

Table C-1. COPEC Identification for Surface Water - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
VOCs	Methyl acetate	79-20-9	0%	-	0.651	-	N	N	N	-	-	Not a COPEC
VOCs	Methyl tert-butyl ether	1634-04-4	0%	-	0.299	730.00	Y	N	N	-	-	Not a COPEC
VOCs	Methylene chloride	75-09-2	0%	-	0.968	-	N	N	N	-	-	Not a COPEC
VOCs	Methylcyclohexane	108-87-2	0%	-	0.421	-	N	N	N	-	-	Not a COPEC
VOCs	4-Methyl-2-pentanone	108-10-1	0%	-	1.249	-	N	N	N	-	-	Not a COPEC
VOCs	Styrene	100-42-5	0%	-	0.348	-	N	N	N	-	-	Not a COPEC
VOCs	Tetrachloroethene	127-18-4	0%	-	0.317	840.00	Y	N	N	-	-	Not a COPEC
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	0%	-	0.559	-	N	N	N	-	-	Not a COPEC
VOCs	Toluene	108-88-3	0%	-	0.695	62.00	Y	N	N	-	-	Not a COPEC
VOCs	1,1,1-Trichloroethane	71-55-6	0%	-	0.350	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2-Trichloroethane	79-00-5	0%	-	0.455	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichlorobenzene	87-61-6	0%	-	0.487	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trichlorobenzene	120-82-1	0%	-	0.653	-	N	N	N	-	-	Not a COPEC
VOCs	Trichloroethene	79-01-6	0%	-	0.451	-	N	N	N	-	-	Not a COPEC
VOCs	Trichlorofluoromethane	75-69-4	0%	-	0.373	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichloropropane	96-18-4	0%	-	1.101	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	0%	-	0.554	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trimethylbenzene	95-63-6	0%	-	0.601	-	N	N	N	-	-	Not a COPEC
VOCs	1,3,5-Trimethylbenzene	108-67-8	0%	-	0.501	-	N	N	N	-	-	Not a COPEC
VOCs	Vinyl chloride	75-01-4	0%	-	0.460	-	N	N	N	-	-	Not a COPEC
VOCs	m, p-Xylene	179601-23-1	0%	-	0.315	-	N	N	N	-	-	Not a COPEC
VOCs	o-Xylene	95-47-6	0%	-	0.351	-	N	N	N	-	-	Not a COPEC

Table C-1. COPEC Identification for Surface Water - Arkansas River/Runyon SWA

Notes:

COPEC: Contaminants of potential ecological concern

MDL: Method detection limit

µg/L: Microgram per liter

SVOCs: Semi volatile organic compounds

SWA: State wildlife area

VOCs: Volatile organic compounds

Table C-2. COPEC Identification for Surface Water - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
Metals	Aluminum	7429-90-5	46%	1,580.000	46.161	87.00	Y	N	Y	Y	18.16	**COPEC**
Metals	Antimony	7440-36-0	24%	4.740	1.545	190.00	Y	N	Y	N	0.02	Not a COPEC
Metals	Arsenic	7440-38-2	64%	10.900	1.083	0.02	Y	N	Y	Y	545.00	**COPEC**
Metals	Barium	7440-39-3	100%	78.900	2.019	220.00	Y	N	Y	N	0.36	Not a COPEC
Metals	Beryllium	7440-41-7	1%	0.254	1.589	100.00	Y	N	N	N	-	Not a COPEC
Metals	Cadmium	7440-43-9	28%	1.570	0.643	10.00	Y	N	Y	N	0.16	Not a COPEC
Metals	Chromium	7440-47-3	20%	9.410	2.347	230.67	Y	N	Y	N	0.04	Not a COPEC
Metals	Cobalt	7440-48-4	38%	0.953	0.897	19.00	Y	N	Y	N	0.05	Not a COPEC
Metals	Copper	7440-50-8	45%	94.500	3.544	200.00	Y	N	Y	N	0.47	Not a COPEC
Metals	Iron	7439-89-6	61%	17,600.000	39.954	1,000.00	Y	N	Y	Y	17.60	**COPEC**
Metals	Lead	7439-92-1	61%	95.800	0.464	100.00	Y	N	Y	N	0.96	Not a COPEC
Metals	Manganese	7439-96-5	91%	511.000	1.870	1,697.71	Y	N	Y	N	0.30	Not a COPEC
Metals	Mercury	7439-97-6	87%	0.027	0.005	0.01	Y	Y	Y	Y	2.74	**COPEC**
Metals	Nickel	7440-02-0	53%	31.610	4.229	100.00	Y	N	Y	N	0.32	Not a COPEC
Metals	Selenium	7782-49-2	98%	118.000	1.749	20.00	Y	Y	Y	Y	5.90	**COPEC**
Metals	Silver	7440-22-4	0%	-	0.643	0.09	Y	N	N	-	-	Not a COPEC
Metals	Thallium	7440-28-0	0%	-	1.164	6.00	Y	N	N	-	-	Not a COPEC
Metals	Vanadium	7440-62-2	45%	45.300	2.235	27.00	Y	N	Y	Y	1.68	**COPEC**
Metals	Zinc	7440-66-6	52%	950.000	17.841	2,000.00	Y	N	Y	N	0.48	Not a COPEC
Metals, Diss	Aluminum	7429-90-5	14%	190.000	46.314	87.00	Y	N	Y	Y	2.18	**COPEC**
Metals, Diss	Antimony	7440-36-0	24%	4.870	1.545	190.00	Y	N	Y	N	0.03	Not a COPEC
Metals, Diss	Arsenic	7440-38-2	59%	11.100	1.083	0.02	Y	N	Y	Y	555.00	**COPEC**
Metals, Diss	Barium	7440-39-3	100%	66.300	2.019	220.00	Y	N	Y	N	0.30	Not a COPEC
Metals, Diss	Beryllium	7440-41-7	2%	4.650	1.605	100.00	Y	N	N	N	-	Not a COPEC
Metals, Diss	Cadmium	7440-43-9	27%	1.420	0.643	10.00	Y	N	Y	N	0.14	Not a COPEC
Metals, Diss	Chromium	7440-47-3	16%	2.180	2.355	230.67	Y	N	Y	N	0.01	Not a COPEC
Metals, Diss	Cobalt	7440-48-4	40%	1.100	0.903	19.00	Y	N	Y	N	0.06	Not a COPEC
Metals, Diss	Copper	7440-50-8	38%	90.600	3.556	200.00	Y	N	Y	N	0.45	Not a COPEC
Metals, Diss	Iron	7439-89-6	25%	14,800.000	40.194	1,000.00	Y	N	Y	Y	14.80	**COPEC**
Metals, Diss	Lead	7439-92-1	29%	91.100	0.464	100.00	Y	N	Y	N	0.91	Not a COPEC

Table C-2. COPEC Identification for Surface Water - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
Metals, Diss	Manganese	7439-96-5	85%	472.000	1.870	1,697.71	Y	N	Y	N	0.28	Not a COPEC
Metals, Diss	Mercury	7439-97-6	82%	0.005	0.005	0.01	Y	Y	Y	N	0.53	**COPEC**
Metals, Diss	Nickel	7440-02-0	55%	8.000	4.243	100.00	Y	N	Y	N	0.08	Not a COPEC
Metals, Diss	Selenium	7782-49-2	98%	107.000	1.749	20.00	Y	Y	Y	Y	5.35	**COPEC**
Metals, Diss	Silver	7440-22-4	0%	-	0.643	0.09	Y	N	N	-	-	Not a COPEC
Metals, Diss	Thallium	7440-28-0	0%	-	1.168	6.00	Y	N	N	-	-	Not a COPEC
Metals, Diss	Vanadium	7440-62-2	34%	44.000	2.242	27.00	Y	N	Y	Y	1.63	**COPEC**
Metals, Diss	Zinc	7440-66-6	44%	929.000	17.841	2,000.00	Y	N	Y	N	0.46	Not a COPEC
SVOCs	Acenaphthene	83-32-9	5%	0.031	0.023	520.00	Y	N	N	N	-	Not a COPEC
SVOCs	Acenaphthylene	208-96-8	1%	0.015	0.024	13.00	Y	N	N	N	-	Not a COPEC
SVOCs	Acetophenone	98-86-2	0%	-	1.115	-	N	N	N	-	-	Not a COPEC
SVOCs	Anthracene	120-12-7	1%	0.020	0.026	-	N	N	N	-	-	Not a COPEC
SVOCs	Atrazine	1912-24-9	0%	-	0.997	5.00	Y	N	N	-	-	Not a COPEC
SVOCs	Benzaldehyde	100-52-7	0%	-	0.933	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzo(a)anthracene	56-55-3	7%	0.130	0.023	4.70	Y	N	Y	N	0.03	Not a COPEC
SVOCs	Benzo(a)pyrene	50-32-8	5%	0.160	0.025	0.06	Y	N	N	Y	-	Not a COPEC
SVOCs	Benzo(b)fluoranthene	205-99-2	12%	0.250	0.019	2.60	Y	N	Y	N	0.10	Not a COPEC
SVOCs	Benzo(g,h,i)perylene	191-24-2	4%	0.110	0.023	0.01	Y	N	N	Y	-	**Source of Uncertainty**
SVOCs	Benzo(k)fluoranthene	207-08-9	2%	0.080	0.027	0.06	Y	N	N	Y	-	Not a COPEC
SVOCs	1,1'-Biphenyl	92-52-4	0%	-	1.133	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Bromophenyl-phenylether	101-55-3	0%	-	1.126	-	N	N	N	-	-	Not a COPEC
SVOCs	Butylbenzylphthalate	85-68-7	0%	-	1.015	-	N	N	N	-	-	Not a COPEC
SVOCs	Caprolactam	105-60-2	0%	-	1.276	-	N	N	N	-	-	Not a COPEC
SVOCs	Carbazole	86-74-8	0%	-	1.039	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chloroaniline	106-47-8	0%	-	1.248	-	N	N	N	-	-	Not a COPEC
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	0%	-	0.958	-	N	N	N	-	-	Not a COPEC
SVOCs	Bis(2-Chloroethyl) ether	111-44-4	0%	-	1.024	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chloro-3-methylphenol	59-50-7	0%	-	1.015	30.00	Y	N	N	-	-	Not a COPEC
SVOCs	2-Chloronaphthalene	91-58-7	0%	-	1.125	620.00	Y	N	N	-	-	Not a COPEC
SVOCs	2-Chlorophenol	95-57-8	0%	-	1.039	2,000.00	Y	N	N	-	-	Not a COPEC

Table C-2. COPEC Identification for Surface Water - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	0%	-	1.104	-	N	N	N	-	-	Not a COPEC
SVOCs	Chrysene	218-01-9	5%	0.180	0.020	4.70	Y	N	N	N	-	Not a COPEC
SVOCs	Dibenzo(a,h)anthracene	53-70-3	1%	0.020	0.026	0.01	Y	N	N	Y	-	**Source of Uncertainty**
SVOCs	Dibenzofuran	132-64-9	0%	-	1.100	-	N	N	N	-	-	Not a COPEC
SVOCs	3,3'-Dichlorobenzidine	91-94-1	0%	-	1.394	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dichlorophenol	120-83-2	0%	-	1.033	365.00	Y	N	N	-	-	Not a COPEC
SVOCs	Diethylphthalate	84-66-2	0%	-	1.072	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dimethylphenol	105-67-9	0%	-	0.835	2,120.00	Y	N	N	-	-	Not a COPEC
SVOCs	Dimethylphthalate	131-11-3	33%	5.500	1.152	1,100.00	Y	N	Y	N	0.01	Not a COPEC
SVOCs	Di-n-butylphthalate	84-74-2	0%	-	0.968	-	N	N	N	-	-	Not a COPEC
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	0%	-	1.132	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dinitrophenol	51-28-5	0%	-	1.365	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dinitrotoluene	121-14-2	0%	-	1.138	-	N	N	N	-	-	Not a COPEC
SVOCs	2,6-Dinitrotoluene	606-20-2	0%	-	1.147	230.00	Y	N	N	-	-	Not a COPEC
SVOCs	Di-n-octylphthalate	117-84-0	0%	-	0.873	-	N	N	N	-	-	Not a COPEC
SVOCs	1,4-Dioxane	123-91-1	0%	-	0.613	-	N	N	N	-	-	Not a COPEC
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	0%	-	0.994	-	N	N	N	-	-	Not a COPEC
SVOCs	Fluoranthene	206-44-0	7%	0.220	0.022	0.80	Y	N	Y	N	0.28	Not a COPEC
SVOCs	Fluorene	86-73-7	0%	-	0.021	-	N	N	N	-	-	Not a COPEC
SVOCs	Hexachlorobenzene	118-74-1	0%	-	1.019	-	N	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorobutadiene	87-68-3	0%	-	0.937	-	N	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	0%	-	2.056	-	N	N	N	-	-	Not a COPEC
SVOCs	Hexachloroethane	67-72-1	0%	-	0.970	-	N	N	N	-	-	Not a COPEC
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	2%	0.090	0.025	0.01	Y	N	N	Y	-	**Source of Uncertainty**
SVOCs	Isophorone	78-59-1	0%	-	0.964	-	N	N	N	-	-	Not a COPEC
SVOCs	1-Methylnaphthalene	90-12-0	0%	-	0.036	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Methylnaphthalene	91-57-6	5%	0.043	0.024	4.70	Y	N	N	N	-	Not a COPEC
SVOCs	2-Methylphenol	95-48-7	0%	-	0.932	-	N	N	N	-	-	Not a COPEC
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	0%	-	0.615	-	N	N	N	-	-	Not a COPEC

Table C-2. COPEC Identification for Surface Water - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	4-Methylphenol	106-44-5	1%	6.750	1.023	53.00	Y	N	N	N	-	Not a COPEC
SVOCs	Naphthalene	91-20-3	14%	0.230	0.026	620.00	Y	N	Y	N	0.00	Not a COPEC
SVOCs	2-Nitroaniline	88-74-4	0%	-	1.207	-	N	N	N	-	-	Not a COPEC
SVOCs	3-Nitroaniline	99-09-2	0%	-	1.117	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Nitroaniline	100-01-6	0%	-	1.178	-	N	N	N	-	-	Not a COPEC
SVOCs	Nitrobenzene	98-95-3	0%	-	0.986	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Nitrophenol	88-75-5	0%	-	1.071	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Nitrophenol	100-02-7	0%	-	1.219	-	N	N	N	-	-	Not a COPEC
SVOCs	N-Nitroso-di-n propylamine	621-64-7	0%	-	1.081	-	N	N	N	-	-	Not a COPEC
SVOCs	N-Nitrosodiphenylamine	86-30-6	0%	-	1.126	-	N	N	N	-	-	Not a COPEC
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	0%	-	1.050	-	N	N	N	-	-	Not a COPEC
SVOCs	Pentachlorophenol	87-86-5	2%	0.060	0.067	15.00	Y	Y	N	N	-	Not a COPEC
SVOCs	Phenanthrene	85-01-8	2%	0.100	0.023	-	N	N	N	-	-	Not a COPEC
SVOCs	Phenol	108-95-2	7%	1.800	1.038	2,560.00	Y	N	Y	N	0.00	Not a COPEC
SVOCs	Pyrene	129-00-0	7%	0.200	0.025	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	0%	-	1.139	-	N	N	N	-	-	Not a COPEC
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	0%	-	1.138	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4,5-Trichlorophenol	95-95-4	0%	-	1.111	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4,6-Trichlorophenol	88-06-2	0%	-	1.130	970.00	Y	N	N	-	-	Not a COPEC
VOCs	Acetone	67-64-1	5%	5.600	1.617	1,700.00	Y	N	N	N	-	Not a COPEC
VOCs	Benzene	71-43-2	0%	-	0.093	-	N	N	N	-	-	Not a COPEC
VOCs	Bromochloromethane	74-97-5	0%	-	0.134	-	N	N	N	-	-	Not a COPEC
VOCs	Bromodichloromethane	75-27-4	0%	-	0.096	-	N	N	N	-	-	Not a COPEC
VOCs	Bromoform	75-25-2	0%	-	0.138	-	N	N	N	-	-	Not a COPEC
VOCs	Bromomethane	74-83-9	0%	-	0.151	-	N	N	N	-	-	Not a COPEC
VOCs	2-Butanone	78-93-3	0%	-	1.375	-	N	N	N	-	-	Not a COPEC
VOCs	Carbon disulfide	75-15-0	5%	2.300	0.093	15.00	Y	N	N	N	-	Not a COPEC
VOCs	Carbon tetrachloride	56-23-5	0%	-	0.119	-	N	N	N	-	-	Not a COPEC
VOCs	Chlorobenzene	108-90-7	0%	-	0.077	-	N	N	N	-	-	Not a COPEC
VOCs	Chloroethane	75-00-3	0%	-	0.129	-	N	N	N	-	-	Not a COPEC

Table C-2. COPEC Identification for Surface Water - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
VOCs	Chloroform	67-66-3	13%	2.100	0.147	1,240.00	Y	N	Y	N	0.00	Not a COPEC
VOCs	Chloromethane	74-87-3	0%	-	0.130	-	N	N	N	-	-	Not a COPEC
VOCs	Cyclohexane	110-82-7	0%	-	0.124	-	N	N	N	-	-	Not a COPEC
VOCs	Dibromochloromethane	124-48-1	0%	-	0.117	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	0%	-	0.286	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromoethane	106-93-4	0%	-	0.110	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichlorobenzene	95-50-1	0%	-	0.109	-	N	N	N	-	-	Not a COPEC
VOCs	1,3-Dichlorobenzene	541-73-1	1%	0.410	0.098	22.00	Y	N	N	N	-	Not a COPEC
VOCs	1,4-Dichlorobenzene	106-46-7	0%	-	0.094	-	N	N	N	-	-	Not a COPEC
VOCs	Dichlorodifluoromethane	75-71-8	0%	-	0.113	-	N	N	N	-	-	Not a COPEC
VOCs	1,1-Dichloroethane	75-34-3	0%	-	0.083	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloroethane	107-06-2	5%	0.320	0.087	20,000.00	Y	N	N	N	-	Not a COPEC
VOCs	1,1-Dichloroethene	75-35-4	0%	-	0.122	-	N	N	N	-	-	Not a COPEC
VOCs	cis-1,2-Dichloroethene	156-59-2	0%	-	0.104	-	N	N	N	-	-	Not a COPEC
VOCs	trans-1,2-Dichloroethene	156-60-5	0%	-	0.115	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloropropane	78-87-5	0%	-	0.103	-	N	N	N	-	-	Not a COPEC
VOCs	cis-1,3-Dichloropropene	10061-01-5	0%	-	0.124	-	N	N	N	-	-	Not a COPEC
VOCs	trans-1,3-Dichloropropene	10061-02-6	0%	-	0.091	-	N	N	N	-	-	Not a COPEC
VOCs	Ethylbenzene	100-41-4	0%	-	0.081	-	N	N	N	-	-	Not a COPEC
VOCs	2-Hexanone	591-78-6	0%	-	0.912	-	N	N	N	-	-	Not a COPEC
VOCs	Isopropylbenzene	98-82-8	0%	-	0.080	-	N	N	N	-	-	Not a COPEC
VOCs	Methyl acetate	79-20-9	0%	-	0.229	-	N	N	N	-	-	Not a COPEC
VOCs	Methyl tert-butyl ether	1634-04-4	5%	1.700	0.090	730.00	Y	N	N	N	-	Not a COPEC
VOCs	Methylene chloride	75-09-2	2%	0.450	0.170	-	N	N	N	-	-	Not a COPEC
VOCs	Methylcyclohexane	108-87-2	0%	-	0.120	-	N	N	N	-	-	Not a COPEC
VOCs	4-Methyl-2-pentanone	108-10-1	0%	-	0.974	-	N	N	N	-	-	Not a COPEC
VOCs	Styrene	100-42-5	0%	-	0.081	-	N	N	N	-	-	Not a COPEC
VOCs	Tetrachloroethene	127-18-4	1%	0.046	0.097	840.00	Y	N	N	N	-	Not a COPEC
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	0%	-	0.147	-	N	N	N	-	-	Not a COPEC
VOCs	Toluene	108-88-3	4%	0.220	0.106	62.00	Y	N	N	N	-	Not a COPEC

Table C-2. COPEC Identification for Surface Water - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
VOCs	1,1,1-Trichloroethane	71-55-6	0%	-	0.105	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2-Trichloroethane	79-00-5	0%	-	0.134	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichlorobenzene	87-61-6	0%	-	0.126	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trichlorobenzene	120-82-1	0%	-	0.118	-	N	N	N	-	-	Not a COPEC
VOCs	Trichloroethene	79-01-6	0%	-	0.116	-	N	N	N	-	-	Not a COPEC
VOCs	Trichlorofluoromethane	75-69-4	0%	-	0.100	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichloropropane	96-18-4	0%	-	0.472	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroet	76-13-1	0%	-	0.121	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trimethylbenzene	95-63-6	0%	-	0.290	-	N	N	N	-	-	Not a COPEC
VOCs	1,3,5-Trimethylbenzene	108-67-8	0%	-	0.211	-	N	N	N	-	-	Not a COPEC
VOCs	Vinyl chloride	75-01-4	0%	-	0.114	-	N	N	N	-	-	Not a COPEC
VOCs	m, p-Xylene	179601-23-1	0%	-	0.084	-	N	N	N	-	-	Not a COPEC
VOCs	o-Xylene	95-47-6	0%	-	0.091	-	N	N	N	-	-	Not a COPEC

Notes:

COPEC: Contaminants of potential ecological concern

MDL: Method detection limit

µg/L: Microgram per liter

SVOCs: Semi volatile organic compounds

VOCs: Volatile organic compounds

Table C-3. COPEC Identification for Sediment - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
Metals	Antimony	7440-36-0	24%	6.050	0.091	2.00	Y	N	Y	Y	3.03	**COPEC**
Metals	Arsenic	7440-38-2	100%	5.500	0.086	9.79	Y	N	Y	N	0.56	Not a COPEC
Metals	Barium	7440-39-3	100%	145.000	0.397	20.00	Y	N	Y	Y	7.25	**COPEC**
Metals	Beryllium	7440-41-7	71%	0.430	0.084	-	N	N	Y	-	-	**Source of Uncertainty**
Metals	Cadmium	7440-43-9	94%	1.500	0.085	0.99	Y	N	Y	Y	1.52	**COPEC**
Metals	Chromium	7440-47-3	100%	9.900	0.161	43.40	Y	N	Y	N	0.23	Not a COPEC
Metals	Cobalt	7440-48-4	100%	4.700	0.055	50.00	Y	N	Y	N	0.09	Not a COPEC
Metals	Copper	7440-50-8	100%	48.500	0.123	31.60	Y	N	Y	Y	1.53	**COPEC**
Metals	Lead	7439-92-1	100%	207.000	0.081	35.80	Y	N	Y	Y	5.78	**COPEC**
Metals	Manganese	7439-96-5	100%	590.000	0.161	460.00	Y	N	Y	Y	1.28	**COPEC**
Metals	Mercury	7439-97-6	45%	0.081	0.011	0.18	Y	Y	Y	N	0.45	**COPEC**
Metals	Nickel	7440-02-0	100%	14.000	0.152	22.70	Y	N	Y	N	0.62	Not a COPEC
Metals	Selenium	7782-49-2	94%	14.000	0.669	0.72	Y	Y	Y	Y	19.44	**COPEC**
Metals	Silver	7440-22-4	76%	0.660	0.032	1.00	Y	N	Y	N	0.66	Not a COPEC
Metals	Thallium	7440-28-0	76%	0.450	0.042	-	N	N	Y	-	-	**Source of Uncertainty**
Metals	Vanadium	7440-62-2	100%	21.000	0.141	27.30	Y	N	Y	N	0.77	Not a COPEC
Metals	Zinc	7440-66-6	100%	1,540.000	0.336	121.00	Y	N	Y	Y	12.73	**COPEC**
SVOCs	1,1'-Biphenyl	92-52-4	0%	-	0.040	-	N	N	N	-	-	Not a COPEC
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	0%	-	0.047	-	N	N	N	-	-	Not a COPEC
SVOCs	1,4-Dioxane	123-91-1	0%	-	0.032	-	N	N	N	-	-	Not a COPEC
SVOCs	1-Methylnaphthalene	90-12-0	0%	-	0.001	-	N	N	N	-	-	Not a COPEC
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	0%	-	0.085	-	N	N	N	-	-	Not a COPEC
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	0%	-	0.047	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4,5-Trichlorophenol	95-95-4	0%	-	0.049	0.00	Y	N	N	-	-	Not a COPEC
SVOCs	2,4,6-Trichlorophenol	88-06-2	0%	-	0.048	0.21	Y	N	N	-	-	Not a COPEC
SVOCs	2,4-Dichlorophenol	120-83-2	0%	-	0.042	0.12	Y	N	N	-	-	Not a COPEC
SVOCs	2,4-Dimethylphenol	105-67-9	0%	-	0.064	0.03	Y	N	N	-	-	Not a COPEC
SVOCs	2,4-Dinitrophenol	51-28-5	0%	-	0.079	0.00	Y	N	N	-	-	Not a COPEC
SVOCs	2,4-Dinitrotoluene	121-14-2	0%	-	0.052	0.04	Y	N	N	-	-	Not a COPEC
SVOCs	2,6-Dinitrotoluene	606-20-2	0%	-	0.040	-	N	N	N	-	-	Not a COPEC

Table C-3. COPEC Identification for Sediment - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	2-Chloronaphthalene	91-58-7	0%	-	0.047	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Chlorophenol	95-57-8	0%	-	0.040	0.03	Y	N	N	-	-	Not a COPEC
SVOCs	2-Methylnaphthalene	91-57-6	22%	0.039	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	2-Methylphenol	95-48-7	0%	-	0.045	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Nitroaniline	88-74-4	0%	-	0.066	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Nitrophenol	88-75-5	0%	-	0.056	-	N	N	N	-	-	Not a COPEC
SVOCs	3,3'-Dichlorobenzidine	91-94-1	0%	-	0.089	0.13	Y	N	N	-	-	Not a COPEC
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	0%	-	0.017	-	N	N	N	-	-	Not a COPEC
SVOCs	3-Nitroaniline	99-09-2	0%	-	0.044	0.00	Y	N	N	-	-	Not a COPEC
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	0%	-	0.090	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Bromophenyl-phenylether	101-55-3	0%	-	0.041	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chloro-3-methylphenol	59-50-7	0%	-	0.051	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chloroaniline	106-47-8	0%	-	0.060	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	0%	-	0.041	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Methylphenol	106-44-5	29%	0.940	0.063	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	4-Nitroaniline	100-01-6	0%	-	0.070	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Nitrophenol	100-02-7	0%	-	0.066	-	N	N	N	-	-	Not a COPEC
SVOCs	Acenaphthene	83-32-9	22%	0.004	0.001	0.01	Y	N	Y	N	0.54	Not a COPEC
SVOCs	Acenaphthylene	208-96-8	28%	0.003	0.001	0.01	Y	N	Y	N	0.54	Not a COPEC
SVOCs	Acetophenone	98-86-2	61%	0.410	0.064	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Anthracene	120-12-7	33%	0.006	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Atrazine	1912-24-9	0%	-	0.075	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzaldehyde	100-52-7	0%	-	0.069	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzo(a)anthracene	56-55-3	72%	0.052	0.001	0.11	Y	N	Y	N	0.48	Not a COPEC
SVOCs	Benzo(a)pyrene	50-32-8	39%	0.057	0.002	0.15	Y	N	Y	N	0.38	Not a COPEC
SVOCs	Benzo(b)fluoranthene	205-99-2	78%	0.079	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Benzo(g,h,i)perylene	191-24-2	50%	0.047	0.001	0.17	Y	N	Y	N	0.28	Not a COPEC
SVOCs	Benzo(k)fluoranthene	207-08-9	44%	0.028	0.001	0.24	Y	N	Y	N	0.12	Not a COPEC
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	0%	-	0.042	-	N	N	N	-	-	Not a COPEC

Table C-3. COPEC Identification for Sediment - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	Bis(2-Chloroethyl)ether	111-44-4	0%	-	0.054	-	N	N	N	-	-	Not a COPEC
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	17%	0.740	0.064	0.18	Y	N	Y	Y	4.11	**COPEC**
SVOCs	Butylbenzylphthalate	85-68-7	0%	-	0.040	10.90	Y	N	N	-	-	Not a COPEC
SVOCs	Caprolactam	105-60-2	0%	-	0.096	-	N	N	N	-	-	Not a COPEC
SVOCs	Carbazole	86-74-8	0%	-	0.056	-	N	N	N	-	-	Not a COPEC
SVOCs	Chrysene	218-01-9	72%	0.065	0.001	0.17	Y	N	Y	N	0.39	Not a COPEC
SVOCs	Dibenzo(a,h)anthracene	53-70-3	11%	0.012	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Dibenzofuran	132-64-9	0%	-	0.047	0.42	Y	N	N	-	-	Not a COPEC
SVOCs	Diethylphthalate	84-66-2	0%	-	0.035	-	N	N	N	-	-	Not a COPEC
SVOCs	Dimethylphthalate	131-11-3	0%	-	0.035	-	N	N	N	-	-	Not a COPEC
SVOCs	Di-n-butylphthalate	84-74-2	0%	-	0.042	-	N	N	N	-	-	Not a COPEC
SVOCs	Di-n-octylphthalate	117-84-0	6%	0.040	0.061	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Fluoranthene	206-44-0	94%	0.126	0.001	0.42	Y	N	Y	N	0.30	Not a COPEC
SVOCs	Fluorene	86-73-7	22%	0.003	0.001	0.08	Y	N	Y	N	0.04	Not a COPEC
SVOCs	Hexachlorobenzene	118-74-1	0%	-	0.049	0.02	Y	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorobutadiene	87-68-3	0%	-	0.052	-	N	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	0%	-	0.110	-	N	N	N	-	-	Not a COPEC
SVOCs	Hexachloroethane	67-72-1	0%	-	0.036	1.00	Y	N	N	-	-	Not a COPEC
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	44%	0.044	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Isophorone	78-59-1	0%	-	0.044	-	N	N	N	-	-	Not a COPEC
SVOCs	Naphthalene	91-20-3	28%	0.019	0.001	0.18	Y	N	Y	N	0.11	Not a COPEC
SVOCs	Nitrobenzene	98-95-3	0%	-	0.072	-	N	N	N	-	-	Not a COPEC
SVOCs	N-Nitroso-di-n propylamine	621-64-7	0%	-	0.061	-	N	N	N	-	-	Not a COPEC
SVOCs	N-Nitrosodiphenylamine	86-30-6	0%	-	0.048	2.70	Y	N	N	-	-	Not a COPEC
SVOCs	Pentachlorophenol	87-86-5	6%	0.036	0.003	0.50	Y	Y	Y	N	0.07	**COPEC**
SVOCs	Phenanthrene	85-01-8	72%	0.037	0.001	0.20	Y	N	Y	N	0.18	Not a COPEC
SVOCs	Phenol	108-95-2	22%	0.089	0.060	0.42	Y	N	Y	N	0.21	Not a COPEC
SVOCs	Pyrene	129-00-0	78%	0.113	0.001	0.20	Y	N	Y	N	0.58	Not a COPEC
VOCs	1,1,1-Trichloroethane	71-55-6	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	0%	-	0.003	-	N	N	N	-	-	Not a COPEC

Table C-3. COPEC Identification for Sediment - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2-Trichloroethane	79-00-5	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,1-Dichloroethane	75-34-3	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,1-Dichloroethene	75-35-4	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichlorobenzene	87-61-6	0%	-	0.003	0.86	Y	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichloropropane	96-18-4	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trichlorobenzene	120-82-1	0%	-	0.003	2.10	Y	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trimethylbenzene	95-63-6	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromoethane	106-93-4	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichlorobenzene	95-50-1	0%	-	0.003	0.02	Y	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloroethane	107-06-2	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloropropane	78-87-5	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,3,5-Trimethylbenzene	108-67-8	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,3-Dichlorobenzene	541-73-1	0%	-	0.003	4.43	Y	N	N	-	-	Not a COPEC
VOCs	1,4-Dichlorobenzene	106-46-7	0%	-	0.003	0.60	Y	N	N	-	-	Not a COPEC
VOCs	2-Butanone	78-93-3	22%	0.060	0.011	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	2-Hexanone	591-78-6	0%	-	0.006	-	N	N	N	-	-	Not a COPEC
VOCs	4-Methyl-2-pentanone	108-10-1	0%	-	0.005	-	N	N	N	-	-	Not a COPEC
VOCs	Acetone	67-64-1	67%	0.250	0.012	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	Benzene	71-43-2	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Bromochloromethane	74-97-5	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Bromodichloromethane	75-27-4	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Bromoform	75-25-2	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Bromomethane	74-83-9	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Carbon disulfide	75-15-0	0%	-	0.003	0.001	Y	N	N	-	-	Not a COPEC
VOCs	Carbon tetrachloride	56-23-5	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Chlorobenzene	108-90-7	0%	-	0.003	-	N	N	N	-	-	Not a COPEC

Table C-3. COPEC Identification for Sediment - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
VOCs	Chloroethane	75-00-3	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	Chloroform	67-66-3	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Chloromethane	74-87-3	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	cis-1,2-Dichloroethene	156-59-2	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	cis-1,3-Dichloropropene	10061-01-5	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Cyclohexane	110-82-7	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Dibromochloromethane	124-48-1	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Dichlorodifluoromethane	75-71-8	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Ethylbenzene	100-41-4	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Isopropylbenzene	98-82-8	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Methyl acetate	79-20-9	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Methyl tert-butyl ether	1634-04-4	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Methylcyclohexane	108-87-2	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Methylene chloride	75-09-2	17%	0.053	0.007	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	o-Xylene	95-47-6	0%	-	0.002	-	N	N	N	-	-	Not a COPEC
VOCs	Styrene	100-42-5	0%	-	0.002	-	N	N	N	-	-	Not a COPEC
VOCs	Tetrachloroethene	127-18-4	0%	-	0.005	-	N	N	N	-	-	Not a COPEC
VOCs	Toluene	108-88-3	11%	0.002	0.003	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	trans-1,2-Dichloroethene	156-60-5	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	trans-1,3-Dichloropropene	10061-02-6	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Trichloroethene	79-01-6	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Trichlorofluoromethane	75-69-4	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	Vinyl chloride	75-01-4	0%	-	0.004	-	N	N	N	-	-	Not a COPEC

Notes:

COPEC: Contaminants of potential ecological concern

MDL: Method detection limit

mg/kg: Milligram per kilogram

SVOCs: Semi volatile organic compounds

SWA: State wildlife area

VOCs: Volatile organic compounds

Table C-4. COPEC Identification for Sediment - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
Metals	Antimony	7440-36-0	96%	29.895	0.386	2.00	Y	N	Y	Y	14.95	**COPEC**
Metals	Arsenic	7440-38-2	100%	416.000	0.239	9.79	Y	N	Y	Y	42.49	**COPEC**
Metals	Barium	7440-39-3	100%	1,340.000	1.898	20.00	Y	N	Y	Y	67.00	**COPEC**
Metals	Beryllium	7440-41-7	89%	0.810	0.231	-	N	N	Y	-	-	**Source of Uncertainty**
Metals	Cadmium	7440-43-9	96%	14.000	0.184	0.99	Y	N	Y	Y	14.14	**COPEC**
Metals	Chromium	7440-47-3	100%	37.100	0.445	43.40	Y	N	Y	N	0.85	Not a COPEC
Metals	Cobalt	7440-48-4	100%	11.100	0.211	50.00	Y	N	Y	N	0.22	Not a COPEC
Metals	Copper	7440-50-8	100%	2,505.000	0.741	31.60	Y	N	Y	Y	79.27	**COPEC**
Metals	Lead	7439-92-1	100%	6,800.000	0.478	35.80	Y	N	Y	Y	189.94	**COPEC**
Metals	Manganese	7439-96-5	100%	7,700.000	0.869	460.00	Y	N	Y	Y	16.74	**COPEC**
Metals	Mercury	7439-97-6	93%	0.460	0.010	0.18	Y	Y	Y	Y	2.56	**COPEC**
Metals	Nickel	7440-02-0	100%	53.900	0.291	22.70	Y	N	Y	Y	2.37	**COPEC**
Metals	Selenium	7782-49-2	100%	72.800	1.117	0.72	Y	Y	Y	Y	101.11	**COPEC**
Metals	Silver	7440-22-4	93%	31.400	0.163	1.00	Y	N	Y	Y	31.40	**COPEC**
Metals	Thallium	7440-28-0	82%	1.100	0.165	-	N	N	Y	-	-	**Source of Uncertainty**
Metals	Vanadium	7440-62-2	100%	114.000	0.704	27.30	Y	N	Y	Y	4.18	**COPEC**
Metals	Zinc	7440-66-6	100%	10,600.000	2.135	121.00	Y	N	Y	Y	87.60	**COPEC**
SVOCs	1,1'-Biphenyl	92-52-4	0%	-	0.039	-	N	N	N	-	-	Not a COPEC
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	0%	-	0.044	-	N	N	N	-	-	Not a COPEC
SVOCs	1,4-Dioxane	123-91-1	0%	-	0.029	-	N	N	N	-	-	Not a COPEC
SVOCs	1-Methylnaphthalene	90-12-0	22%	0.005	0.003	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	0%	-	0.033	-	N	N	N	-	-	Not a COPEC
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	0%	-	0.046	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4,5-Trichlorophenol	95-95-4	0%	-	0.038	0.00	Y	N	N	-	-	Not a COPEC
SVOCs	2,4,6-Trichlorophenol	88-06-2	0%	-	0.049	0.21	Y	N	N	-	-	Not a COPEC
SVOCs	2,4-Dichlorophenol	120-83-2	0%	-	0.046	0.12	Y	N	N	-	-	Not a COPEC
SVOCs	2,4-Dimethylphenol	105-67-9	0%	-	0.057	0.03	Y	N	N	-	-	Not a COPEC
SVOCs	2,4-Dinitrophenol	51-28-5	0%	-	0.048	0.00	Y	N	N	-	-	Not a COPEC
SVOCs	2,4-Dinitrotoluene	121-14-2	0%	-	0.048	0.04	Y	N	N	-	-	Not a COPEC
SVOCs	2,6-Dinitrotoluene	606-20-2	0%	-	0.040	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Chloronaphthalene	91-58-7	0%	-	0.042	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Chlorophenol	95-57-8	0%	-	0.039	0.03	Y	N	N	-	-	Not a COPEC
SVOCs	2-Methylnaphthalene	91-57-6	68%	0.055	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	2-Methylphenol	95-48-7	4%	0.054	0.029	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Nitroaniline	88-74-4	0%	-	0.041	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Nitrophenol	88-75-5	0%	-	0.049	-	N	N	N	-	-	Not a COPEC

Table C-4. COPEC Identification for Sediment - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	3,3'-Dichlorobenzidine	91-94-1	0%	-	0.097	0.13	Y	N	N	-	-	Not a COPEC
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	7%	0.380	0.025	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	3-Nitroaniline	99-09-2	0%	-	0.045	0.00	Y	N	N	-	-	Not a COPEC
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	0%	-	0.051	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Bromophenyl-phenylether	101-55-3	0%	-	0.043	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chloro-3-methylphenol	59-50-7	0%	-	0.041	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chloroaniline	106-47-8	0%	-	0.050	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	0%	-	0.039	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Methylphenol	106-44-5	11%	4.700	0.094	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	4-Nitroaniline	100-01-6	0%	-	0.061	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Nitrophenol	100-02-7	0%	-	0.057	-	N	N	N	-	-	Not a COPEC
SVOCs	Acenaphthene	83-32-9	75%	0.082	0.001	0.01	Y	N	Y	Y	12.24	**COPEC**
SVOCs	Acenaphthylene	208-96-8	93%	0.053	0.001	0.01	Y	N	Y	Y	8.98	**COPEC**
SVOCs	Acetophenone	98-86-2	4%	0.270	0.041	-	N	N	N	-	-	Not a COPEC
SVOCs	Anthracene	120-12-7	96%	0.190	0.002	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Atrazine	1912-24-9	0%	-	0.051	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzaldehyde	100-52-7	7%	0.160	0.050	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Benzo(a)anthracene	56-55-3	100%	0.520	0.004	0.11	Y	N	Y	Y	4.81	**COPEC**
SVOCs	Benzo(a)pyrene	50-32-8	100%	0.510	0.004	0.15	Y	N	Y	Y	3.40	**COPEC**
SVOCs	Benzo(b)fluoranthene	205-99-2	100%	0.580	0.006	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Benzo(g,h,i)perylene	191-24-2	100%	0.350	0.005	0.17	Y	N	Y	Y	2.06	**COPEC**
SVOCs	Benzo(k)fluoranthene	207-08-9	100%	0.270	0.003	0.24	Y	N	Y	Y	1.13	**COPEC**
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	0%	-	0.047	-	N	N	N	-	-	Not a COPEC
SVOCs	Bis(2-Chloroethyl)ether	111-44-4	0%	-	0.048	-	N	N	N	-	-	Not a COPEC
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	43%	0.280	0.036	0.18	Y	N	Y	Y	1.56	**COPEC**
SVOCs	Butylbenzylphthalate	85-68-7	14%	0.057	0.050	10.90	Y	N	Y	N	0.01	Not a COPEC
SVOCs	Caprolactam	105-60-2	0%	-	0.046	-	N	N	N	-	-	Not a COPEC
SVOCs	Carbazole	86-74-8	11%	0.110	0.045	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Chrysene	218-01-9	100%	0.490	0.004	0.17	Y	N	Y	Y	2.95	**COPEC**
SVOCs	Dibenzo(a,h)anthracene	53-70-3	14%	0.012	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Dibenzofuran	132-64-9	7%	0.053	0.042	0.42	Y	N	Y	N	0.13	Not a COPEC
SVOCs	Diethylphthalate	84-66-2	0%	-	0.044	-	N	N	N	-	-	Not a COPEC
SVOCs	Dimethylphthalate	131-11-3	0%	-	0.042	-	N	N	N	-	-	Not a COPEC
SVOCs	Di-n-butylphthalate	84-74-2	0%	-	0.043	-	N	N	N	-	-	Not a COPEC
SVOCs	Di-n-octylphthalate	117-84-0	0%	-	0.131	-	N	N	N	-	-	Not a COPEC

Table C-4. COPEC Identification for Sediment - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	Fluoranthene	206-44-0	100%	1.500	0.005	0.42	Y	N	Y	Y	3.55	**COPEC**
SVOCs	Fluorene	86-73-7	54%	0.068	0.002	0.08	Y	N	Y	N	0.88	Not a COPEC
SVOCs	Hexachlorobenzene	118-74-1	0%	-	0.040	0.02	Y	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorobutadiene	87-68-3	0%	-	0.043	-	N	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	0%	-	0.046	-	N	N	N	-	-	Not a COPEC
SVOCs	Hexachloroethane	67-72-1	0%	-	0.033	1.00	Y	N	N	-	-	Not a COPEC
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	100%	0.310	0.004	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Isophorone	78-59-1	0%	-	0.038	-	N	N	N	-	-	Not a COPEC
SVOCs	Naphthalene	91-20-3	75%	0.130	0.002	0.18	Y	N	Y	N	0.74	Not a COPEC
SVOCs	Nitrobenzene	98-95-3	0%	-	0.041	-	N	N	N	-	-	Not a COPEC
SVOCs	N-Nitroso-di-n propylamine	621-64-7	11%	0.442	0.049	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	N-Nitrosodiphenylamine	86-30-6	0%	-	0.042	2.70	Y	N	N	-	-	Not a COPEC
SVOCs	Pentachlorophenol	87-86-5	57%	0.027	0.004	0.50	Y	Y	Y	N	0.05	**COPEC**
SVOCs	Phenanthrene	85-01-8	96%	0.790	0.005	0.20	Y	N	Y	Y	3.87	**COPEC**
SVOCs	Phenol	108-95-2	14%	0.138	0.046	0.42	Y	N	Y	N	0.33	Not a COPEC
SVOCs	Pyrene	129-00-0	100%	1.000	0.005	0.20	Y	N	Y	Y	5.13	**COPEC**
VOCs	1,1,1-Trichloroethane	71-55-6	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	0%	-	0.006	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2-Trichloroethane	79-00-5	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,1-Dichloroethane	75-34-3	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,1-Dichloroethene	75-35-4	0%	-	0.005	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichlorobenzene	87-61-6	0%	-	0.003	0.86	Y	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichloropropane	96-18-4	0%	-	0.007	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trichlorobenzene	120-82-1	0%	-	0.004	2.10	Y	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trimethylbenzene	95-63-6	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromoethane	106-93-4	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichlorobenzene	95-50-1	0%	-	0.003	0.02	Y	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloroethane	107-06-2	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloropropane	78-87-5	0%	-	0.002	-	N	N	N	-	-	Not a COPEC
VOCs	1,3,5-Trimethylbenzene	108-67-8	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,3-Dichlorobenzene	541-73-1	0%	-	0.003	4.43	Y	N	N	-	-	Not a COPEC
VOCs	1,4-Dichlorobenzene	106-46-7	0%	-	0.003	0.60	Y	N	N	-	-	Not a COPEC
VOCs	2-Butanone	78-93-3	54%	0.054	0.012	-	N	N	Y	-	-	**Source of Uncertainty**

Table C-4. COPEC Identification for Sediment - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
VOCs	2-Hexanone	591-78-6	18%	0.019	0.009	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	4-Methyl-2-pentanone	108-10-1	0%	-	0.007	-	N	N	N	-	-	Not a COPEC
VOCs	Acetone	67-64-1	71%	0.110	0.016	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	Benzene	71-43-2	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Bromochloromethane	74-97-5	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Bromodichloromethane	75-27-4	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Bromoform	75-25-2	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Bromomethane	74-83-9	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	Carbon disulfide	75-15-0	11%	0.008	0.004	0.00	Y	N	Y	Y	9.17	**COPEC**
VOCs	Carbon tetrachloride	56-23-5	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	Chlorobenzene	108-90-7	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Chloroethane	75-00-3	0%	-	0.006	-	N	N	N	-	-	Not a COPEC
VOCs	Chloroform	67-66-3	7%	0.004	0.004	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	Chloromethane	74-87-3	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	cis-1,2-Dichloroethene	156-59-2	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	cis-1,3-Dichloropropene	10061-01-5	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Cyclohexane	110-82-7	0%	-	0.005	-	N	N	N	-	-	Not a COPEC
VOCs	Dibromochloromethane	124-48-1	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Dichlorodifluoromethane	75-71-8	0%	-	0.006	-	N	N	N	-	-	Not a COPEC
VOCs	Ethylbenzene	100-41-4	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Isopropylbenzene	98-82-8	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	m,p-Xylene	179601-23-1	0%	-	0.005	-	N	N	N	-	-	Not a COPEC
VOCs	Methyl acetate	79-20-9	4%	0.002	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	Methyl tert-butyl ether	1634-04-4	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Methylcyclohexane	108-87-2	0%	-	0.006	-	N	N	N	-	-	Not a COPEC
VOCs	Methylene chloride	75-09-2	7%	0.005	0.004	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	o-Xylene	95-47-6	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Styrene	100-42-5	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Tetrachloroethene	127-18-4	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	Toluene	108-88-3	21%	0.026	0.003	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	trans-1,2-Dichloroethene	156-60-5	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	trans-1,3-Dichloropropene	10061-02-6	0%	-	0.004	-	N	N	N	-	-	Not a COPEC
VOCs	Trichloroethene	79-01-6	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	Trichlorofluoromethane	75-69-4	0%	-	0.005	-	N	N	N	-	-	Not a COPEC
VOCs	Vinyl chloride	75-01-4	0%	-	0.005	-	N	N	N	-	-	Not a COPEC

Table C-4. COPEC Identification for Sediment - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification

Notes:

COPEC: Contaminants of potential ecological concern

MDL: Method detection limit

mg/kg: Milligram per kilogram

SVOCs: Semi volatile organic compounds

SWA: State wildlife area

VOCs: Volatile organic compounds

Table C-5. COPEC Identification for Pore Water - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
Metals	Aluminum	7429-90-5	57%	3,200.000	71.507	87.00	Y	N	Y	Y	36.78	**COPEC**
Metals	Antimony	7440-36-0	21%	1.290	1.611	190.00	Y	N	Y	N	0.01	Not a COPEC
Metals	Arsenic	7440-38-2	57%	7.930	1.137	0.02	Y	N	Y	Y	396.50	**COPEC**
Metals	Barium	7440-39-3	100%	213.000	1.894	220.00	Y	N	Y	N	0.97	Not a COPEC
Metals	Beryllium	7440-41-7	0%	-	1.705	3.60	Y	N	N	-	-	Not a COPEC
Metals	Cadmium	7440-43-9	7%	0.426	0.664	1.21	Y	N	Y	N	0.35	Not a COPEC
Metals	Chromium	7440-47-3	7%	5.450	3.850	130.75	Y	N	Y	N	0.04	Not a COPEC
Metals	Cobalt	7440-48-4	29%	2.510	0.947	19.00	Y	N	Y	N	0.13	Not a COPEC
Metals	Copper	7440-50-8	21%	7.870	3.867	16.19	Y	N	Y	N	0.49	Not a COPEC
Metals	Iron	7439-89-6	79%	6,090.000	37.886	1,000.00	Y	N	Y	Y	6.09	**COPEC**
Metals	Lead	7439-92-1	57%	15.800	0.475	5.31	Y	N	Y	Y	2.98	**COPEC**
Metals	Manganese	7439-96-5	100%	792.000	1.989	2,078.02	Y	N	Y	N	0.38	Not a COPEC
Metals	Mercury	7439-97-6	93%	0.018	0.000	0.01	Y	Y	Y	Y	1.79	**COPEC**
Metals	Nickel	7440-02-0	21%	8.230	4.539	100.00	Y	N	Y	N	0.08	Not a COPEC
Metals	Selenium	7782-49-2	79%	29.700	1.705	17.10	Y	Y	Y	Y	1.74	**COPEC**
Metals	Silver	7440-22-4	0%	-	0.664	1.05	Y	N	N	-	-	Not a COPEC
Metals	Thallium	7440-28-0	0%	-	1.232	-	N	N	N	-	-	Not a COPEC
Metals	Vanadium	7440-62-2	43%	15.200	2.474	-	N	N	Y	-	-	**Source of Uncertainty**
Metals	Zinc	7440-66-6	21%	80.800	20.986	227.62	Y	N	Y	N	0.35	Not a COPEC
Metals, Diss	Aluminum	7429-90-5	29%	70.700	71.507	87.00	Y	N	Y	N	0.81	Not a COPEC
Metals, Diss	Antimony	7440-36-0	21%	2.420	1.611	190.00	Y	N	Y	N	0.01	Not a COPEC
Metals, Diss	Arsenic	7440-38-2	57%	8.080	1.137	0.02	Y	N	Y	Y	404.00	**COPEC**
Metals, Diss	Barium	7440-39-3	100%	210.000	1.894	220.00	Y	N	Y	N	0.95	Not a COPEC
Metals, Diss	Beryllium	7440-41-7	0%	-	1.705	3.60	Y	N	N	-	-	Not a COPEC
Metals, Diss	Cadmium	7440-43-9	0%	-	0.664	1.21	Y	N	N	-	-	Not a COPEC
Metals, Diss	Chromium	7440-47-3	0%	-	3.850	130.75	Y	N	N	-	-	Not a COPEC
Metals, Diss	Cobalt	7440-48-4	14%	1.450	0.947	19.00	Y	N	Y	N	0.08	Not a COPEC
Metals, Diss	Copper	7440-50-8	7%	3.950	3.867	16.19	Y	N	Y	N	0.24	Not a COPEC

Table C-5. COPEC Identification for Pore Water - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
Metals, Diss	Iron	7439-89-6	36%	4,030.000	37.886	1,000.00	Y	N	Y	Y	4.03	**COPEC**
Metals, Diss	Lead	7439-92-1	14%	3.780	0.475	5.31	Y	N	Y	N	0.71	Not a COPEC
Metals, Diss	Manganese	7439-96-5	93%	753.000	1.989	2,078.02	Y	N	Y	N	0.36	Not a COPEC
Metals, Diss	Mercury	7439-97-6	36%	0.012	0.000	0.01	Y	Y	Y	Y	1.21	**COPEC**
Metals, Diss	Nickel	7440-02-0	7%	2.890	4.539	93.48	Y	N	Y	N	0.03	Not a COPEC
Metals, Diss	Selenium	7782-49-2	100%	30.500	1.705	17.10	Y	Y	Y	Y	1.78	**COPEC**
Metals, Diss	Silver	7440-22-4	0%	-	0.664	1.05	Y	N	N	-	-	Not a COPEC
Metals, Diss	Thallium	7440-28-0	0%	-	1.232	-	N	N	N	-	-	Not a COPEC
Metals, Diss	Vanadium	7440-62-2	36%	3.510	2.474	-	N	N	Y	-	-	**Source of Uncertainty**
Metals, Diss	Zinc	7440-66-6	7%	14.700	20.986	227.62	Y	N	Y	N	0.06	Not a COPEC
SVOCs	Acenaphthene	83-32-9	0%	-	0.014	-	N	N	N	-	-	Not a COPEC
SVOCs	Acenaphthylene	208-96-8	0%	-	0.020	-	N	N	N	-	-	Not a COPEC
SVOCs	Acetophenone	98-86-2	0%	-	1.316	-	N	N	N	-	-	Not a COPEC
SVOCs	Anthracene	120-12-7	0%	-	0.016	-	N	N	N	-	-	Not a COPEC
SVOCs	Atrazine	1912-24-9	0%	-	1.337	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzaldehyde	100-52-7	0%	-	1.082	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzo(a)anthracene	56-55-3	0%	-	0.012	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzo(a)pyrene	50-32-8	0%	-	0.034	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzo(b)fluoranthene	205-99-2	0%	-	0.017	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzo(g,h,i)perylene	191-24-2	0%	-	0.025	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzo(k)fluoranthene	207-08-9	0%	-	0.012	-	N	N	N	-	-	Not a COPEC
SVOCs	1,1'-Biphenyl	92-52-4	0%	-	0.761	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Bromophenyl-phenylether	101-55-3	0%	-	0.741	-	N	N	N	-	-	Not a COPEC
SVOCs	Butylbenzylphthalate	85-68-7	0%	-	0.676	-	N	N	N	-	-	Not a COPEC
SVOCs	Caprolactam	105-60-2	0%	-	2.300	-	N	N	N	-	-	Not a COPEC
SVOCs	Carbazole	86-74-8	0%	-	1.053	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chloroaniline	106-47-8	0%	-	1.064	-	N	N	N	-	-	Not a COPEC
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	0%	-	0.778	-	N	N	N	-	-	Not a COPEC

Table C-5. COPEC Identification for Pore Water - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	Bis(2-Chloroethyl) ether	111-44-4	0%	-	1.061	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chloro-3-methylphenol	59-50-7	0%	-	0.985	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Chloronaphthalene	91-58-7	0%	-	0.794	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Chlorophenol	95-57-8	0%	-	0.815	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	0%	-	0.749	-	N	N	N	-	-	Not a COPEC
SVOCs	Chrysene	218-01-9	0%	-	0.020	-	N	N	N	-	-	Not a COPEC
SVOCs	Dibenzo(a,h)anthracene	53-70-3	0%	-	0.017	-	N	N	N	-	-	Not a COPEC
SVOCs	Dibenzofuran	132-64-9	0%	-	0.826	-	N	N	N	-	-	Not a COPEC
SVOCs	3,3'-Dichlorobenzidine	91-94-1	0%	-	1.050	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dichlorophenol	120-83-2	0%	-	0.831	-	N	N	N	-	-	Not a COPEC
SVOCs	Diethylphthalate	84-66-2	0%	-	0.519	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dimethylphenol	105-67-9	0%	-	1.227	-	N	N	N	-	-	Not a COPEC
SVOCs	Dimethylphthalate	131-11-3	0%	-	0.595	-	N	N	N	-	-	Not a COPEC
SVOCs	Di-n-butylphthalate	84-74-2	0%	-	0.441	-	N	N	N	-	-	Not a COPEC
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	0%	-	1.791	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dinitrophenol	51-28-5	0%	-	1.677	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dinitrotoluene	121-14-2	0%	-	0.844	-	N	N	N	-	-	Not a COPEC
SVOCs	2,6-Dinitrotoluene	606-20-2	0%	-	0.673	-	N	N	N	-	-	Not a COPEC
SVOCs	Di-n-octylphthalate	117-84-0	0%	-	0.673	-	N	N	N	-	-	Not a COPEC
SVOCs	1,4-Dioxane	123-91-1	0%	-	0.646	-	N	N	N	-	-	Not a COPEC
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	0%	-	0.861	-	N	N	N	-	-	Not a COPEC
SVOCs	Fluoranthene	206-44-0	0%	-	0.022	-	N	N	N	-	-	Not a COPEC
SVOCs	Fluorene	86-73-7	0%	-	0.015	-	N	N	N	-	-	Not a COPEC
SVOCs	Hexachlorobenzene	118-74-1	0%	-	0.625	-	N	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorobutadiene	87-68-3	0%	-	0.882	-	N	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	0%	-	2.443	-	N	N	N	-	-	Not a COPEC
SVOCs	Hexachloroethane	67-72-1	0%	-	0.699	-	N	N	N	-	-	Not a COPEC
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	0%	-	0.022	-	N	N	N	-	-	Not a COPEC
SVOCs	Isophorone	78-59-1	0%	-	0.718	-	N	N	N	-	-	Not a COPEC

Table C-5. COPEC Identification for Pore Water - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	1-Methylnaphthalene	90-12-0	0%	-	0.013	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Methylnaphthalene	91-57-6	0%	-	0.014	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Methylphenol	95-48-7	0%	-	1.061	-	N	N	N	-	-	Not a COPEC
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	0%	-	0.600	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Methylphenol	106-44-5	15%	15.000	0.943	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Naphthalene	91-20-3	0%	-	0.018	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Nitroaniline	88-74-4	0%	-	1.210	-	N	N	N	-	-	Not a COPEC
SVOCs	3-Nitroaniline	99-09-2	0%	-	0.898	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Nitroaniline	100-01-6	0%	-	1.237	-	N	N	N	-	-	Not a COPEC
SVOCs	Nitrobenzene	98-95-3	0%	-	1.210	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Nitrophenol	88-75-5	0%	-	1.006	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Nitrophenol	100-02-7	0%	-	1.276	-	N	N	N	-	-	Not a COPEC
SVOCs	N-Nitroso-di-n propylamine	621-64-7	0%	-	1.091	-	N	N	N	-	-	Not a COPEC
SVOCs	N-Nitrosodiphenylamine	86-30-6	0%	-	0.785	-	N	N	N	-	-	Not a COPEC
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	0%	-	1.699	-	N	N	N	-	-	Not a COPEC
SVOCs	Pentachlorophenol	87-86-5	0%	-	0.086	15.00	Y	Y	N	-	-	Not a COPEC
SVOCs	Phenanthrene	85-01-8	0%	-	0.022	-	N	N	N	-	-	Not a COPEC
SVOCs	Phenol	108-95-2	7%	3.500	1.204	2,560.00	Y	N	Y	N	0.00	Not a COPEC
SVOCs	Pyrene	129-00-0	0%	-	0.023	-	N	N	N	-	-	Not a COPEC
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	0%	-	0.882	-	N	N	N	-	-	Not a COPEC
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	0%	-	0.694	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4,5-Trichlorophenol	95-95-4	0%	-	0.781	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4,6-Trichlorophenol	88-06-2	0%	-	0.909	-	N	N	N	-	-	Not a COPEC
VOCs	Acetone	67-64-1	14%	17.000	3.050	1,700.00	Y	N	Y	N	0.01	Not a COPEC
VOCs	Benzene	71-43-2	0%	-	0.459	-	N	N	N	-	-	Not a COPEC
VOCs	Bromochloromethane	74-97-5	0%	-	0.477	-	N	N	N	-	-	Not a COPEC
VOCs	Bromodichloromethane	75-27-4	0%	-	0.557	-	N	N	N	-	-	Not a COPEC
VOCs	Bromoform	75-25-2	0%	-	0.962	-	N	N	N	-	-	Not a COPEC

Table C-5. COPEC Identification for Pore Water - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
VOCs	Bromomethane	74-83-9	0%	-	0.964	-	N	N	N	-	-	Not a COPEC
VOCs	2-Butanone	78-93-3	7%	9.100	2.386	-	N	N	Y	-	-	Source of Uncertainty
VOCs	Carbon disulfide	75-15-0	0%	-	0.708	15.00	Y	N	N	-	-	Not a COPEC
VOCs	Carbon tetrachloride	56-23-5	0%	-	0.518	-	N	N	N	-	-	Not a COPEC
VOCs	Chlorobenzene	108-90-7	0%	-	0.391	-	N	N	N	-	-	Not a COPEC
VOCs	Chloroethane	75-00-3	0%	-	0.548	-	N	N	N	-	-	Not a COPEC
VOCs	Chloroform	67-66-3	0%	-	1.422	-	N	N	N	-	-	Not a COPEC
VOCs	Chloromethane	74-87-3	0%	-	1.041	-	N	N	N	-	-	Not a COPEC
VOCs	Cyclohexane	110-82-7	0%	-	0.485	-	N	N	N	-	-	Not a COPEC
VOCs	Dibromochloromethane	124-48-1	0%	-	0.577	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	0%	-	1.079	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromoethane	106-93-4	0%	-	0.680	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichlorobenzene	95-50-1	0%	-	0.675	-	N	N	N	-	-	Not a COPEC
VOCs	1,3-Dichlorobenzene	541-73-1	0%	-	0.500	22.00	Y	N	N	-	-	Not a COPEC
VOCs	1,4-Dichlorobenzene	106-46-7	0%	-	0.459	-	N	N	N	-	-	Not a COPEC
VOCs	Dichlorodifluoromethane	75-71-8	0%	-	0.463	-	N	N	N	-	-	Not a COPEC
VOCs	1,1-Dichloroethane	75-34-3	0%	-	0.510	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloroethane	107-06-2	0%	-	0.654	-	N	N	N	-	-	Not a COPEC
VOCs	1,1-Dichloroethene	75-35-4	0%	-	0.718	-	N	N	N	-	-	Not a COPEC
VOCs	cis-1,2-Dichloroethene	156-59-2	0%	-	0.558	-	N	N	N	-	-	Not a COPEC
VOCs	trans-1,2-Dichloroethene	156-60-5	0%	-	0.444	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloropropane	78-87-5	0%	-	0.460	-	N	N	N	-	-	Not a COPEC
VOCs	cis-1,3-Dichloropropene	10061-01-5	0%	-	0.484	-	N	N	N	-	-	Not a COPEC
VOCs	trans-1,3-Dichloropropene	10061-02-6	0%	-	0.583	-	N	N	N	-	-	Not a COPEC
VOCs	Ethylbenzene	100-41-4	0%	-	0.425	-	N	N	N	-	-	Not a COPEC
VOCs	2-Hexanone	591-78-6	0%	-	4.564	-	N	N	N	-	-	Not a COPEC
VOCs	Isopropylbenzene	98-82-8	0%	-	0.475	-	N	N	N	-	-	Not a COPEC
VOCs	Methyl acetate	79-20-9	0%	-	0.907	-	N	N	N	-	-	Not a COPEC

Table C-5. COPEC Identification for Pore Water - Arkansas River/Runyon SWA

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
VOCs	Methyl tert-butyl ether	1634-04-4	0%	-	0.403	-	N	N	N	-	-	Not a COPEC
VOCs	Methylene chloride	75-09-2	0%	-	1.429	-	N	N	N	-	-	Not a COPEC
VOCs	Methylcyclohexane	108-87-2	0%	-	0.577	-	N	N	N	-	-	Not a COPEC
VOCs	4-Methyl-2-pentanone	108-10-1	0%	-	1.207	-	N	N	N	-	-	Not a COPEC
VOCs	Styrene	100-42-5	0%	-	0.495	-	N	N	N	-	-	Not a COPEC
VOCs	Tetrachloroethene	127-18-4	0%	-	0.432	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	0%	-	0.806	-	N	N	N	-	-	Not a COPEC
VOCs	Toluene	108-88-3	0%	-	1.029	62.00	Y	N	N	-	-	Not a COPEC
VOCs	1,1,1-Trichloroethane	71-55-6	0%	-	0.477	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2-Trichloroethane	79-00-5	0%	-	0.625	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichlorobenzene	87-61-6	0%	-	0.691	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trichlorobenzene	120-82-1	0%	-	0.954	-	N	N	N	-	-	Not a COPEC
VOCs	Trichloroethene	79-01-6	0%	-	0.638	-	N	N	N	-	-	Not a COPEC
VOCs	Trichlorofluoromethane	75-69-4	0%	-	0.522	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichloropropane	96-18-4	0%	-	1.200	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	0%	-	0.792	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trimethylbenzene	95-63-6	0%	-	0.650	-	N	N	N	-	-	Not a COPEC
VOCs	1,3,5-Trimethylbenzene	108-67-8	0%	-	0.550	-	N	N	N	-	-	Not a COPEC
VOCs	Vinyl chloride	75-01-4	0%	-	0.665	-	N	N	N	-	-	Not a COPEC
VOCs	m, p-Xylene	179601-23-1	0%	-	0.441	-	N	N	N	-	-	Not a COPEC
VOCs	o-Xylene	95-47-6	0%	-	0.497	-	N	N	N	-	-	Not a COPEC

Notes:

COPEC: Contaminants of potential ecological concern

MDL: Method detection limit

µg/L: Microgram per liter

SVOCs: Semi volatile organic compounds

SWA: State wildlife area

VOCs: Volatile organic compounds

Table C-6. COPEC Identification for Pore Water - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
Metals	Aluminum	7429-90-5	50%	1,155.500	81.286	87.00	Y	N	Y	Y	13.28	**COPEC**
Metals	Antimony	7440-36-0	14%	2.500	3.044	190.00	Y	N	Y	N	0.01	Not a COPEC
Metals	Arsenic	7440-38-2	64%	24.700	2.096	0.02	Y	N	Y	Y	1235.00	**COPEC**
Metals	Barium	7440-39-3	100%	77.500	3.636	220.00	Y	N	Y	N	0.35	Not a COPEC
Metals	Beryllium	7440-41-7	0%	-	3.022	100.00	Y	N	N	-	-	Not a COPEC
Metals	Cadmium	7440-43-9	29%	1.200	1.204	10.00	Y	N	Y	N	0.12	Not a COPEC
Metals	Chromium	7440-47-3	29%	1.700	4.164	230.67	Y	N	Y	N	0.01	Not a COPEC
Metals	Cobalt	7440-48-4	36%	5.000	1.642	19.00	Y	N	Y	N	0.26	Not a COPEC
Metals	Copper	7440-50-8	57%	85.000	6.558	200.00	Y	N	Y	N	0.43	Not a COPEC
Metals	Iron	7439-89-6	79%	29,400.000	75.543	1,000.00	Y	N	Y	Y	29.40	**COPEC**
Metals	Lead	7439-92-1	79%	120.000	0.866	100.00	Y	N	Y	Y	1.20	**COPEC**
Metals	Manganese	7439-96-5	86%	5,000.000	3.665	1,697.71	Y	N	Y	Y	2.95	**COPEC**
Metals	Mercury	7439-97-6	64%	0.004	0.017	0.01	Y	Y	Y	N	0.37	**COPEC**
Metals	Nickel	7440-02-0	43%	12.000	7.839	100.00	Y	N	Y	N	0.12	Not a COPEC
Metals	Selenium	7782-49-2	86%	89.100	3.379	20.00	Y	Y	Y	Y	4.46	**COPEC**
Metals	Silver	7440-22-4	0%	-	1.219	-	N	N	N	-	-	Not a COPEC
Metals	Thallium	7440-28-0	0%	-	2.191	-	N	N	N	-	-	Not a COPEC
Metals	Vanadium	7440-62-2	50%	13.600	4.113	-	N	N	Y	-	-	**Source of Uncertainty**
Metals	Zinc	7440-66-6	57%	634.000	33.061	2,000.00	Y	N	Y	N	0.32	Not a COPEC
Metals, Diss	Aluminum	7429-90-5	36%	44.700	83.143	87.00	Y	N	Y	N	0.51	Not a COPEC
Metals, Diss	Antimony	7440-36-0	29%	21.700	3.044	190.00	Y	N	Y	N	0.11	Not a COPEC
Metals, Diss	Arsenic	7440-38-2	57%	22.400	2.096	0.02	Y	N	Y	Y	1120.00	**COPEC**
Metals, Diss	Barium	7440-39-3	100%	77.800	3.636	220.00	Y	N	Y	N	0.35	Not a COPEC
Metals, Diss	Beryllium	7440-41-7	0%	-	3.022	100.00	Y	N	N	-	-	Not a COPEC
Metals, Diss	Cadmium	7440-43-9	21%	1.200	1.204	10.00	Y	N	Y	N	0.12	Not a COPEC
Metals, Diss	Chromium	7440-47-3	36%	0.700	4.072	230.67	Y	N	Y	N	0.00	Not a COPEC
Metals, Diss	Cobalt	7440-48-4	43%	4.200	1.606	19.00	Y	N	Y	N	0.22	Not a COPEC
Metals, Diss	Copper	7440-50-8	50%	80.700	6.412	200.00	Y	N	Y	N	0.40	Not a COPEC
Metals, Diss	Iron	7439-89-6	57%	28,500.000	74.086	1,000.00	Y	N	Y	Y	28.50	**COPEC**
Metals, Diss	Lead	7439-92-1	50%	67.100	0.866	100.00	Y	N	Y	N	0.67	Not a COPEC

Table C-6. COPEC Identification for Pore Water - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
Metals, Diss	Manganese	7439-96-5	86%	4,600.000	3.665	1,697.71	Y	N	Y	Y	2.71	**COPEC**
Metals, Diss	Mercury	7439-97-6	64%	0.002	0.017	0.01	Y	Y	Y	N	0.23	**COPEC**
Metals, Diss	Nickel	7440-02-0	36%	6.400	7.668	100.00	Y	N	Y	N	0.06	Not a COPEC
Metals, Diss	Selenium	7782-49-2	86%	93.000	3.379	20.00	Y	Y	Y	Y	4.65	**COPEC**
Metals, Diss	Silver	7440-22-4	0%	-	1.219	-	N	N	N	-	-	Not a COPEC
Metals, Diss	Thallium	7440-28-0	0%	-	2.191	-	N	N	N	-	-	Not a COPEC
Metals, Diss	Vanadium	7440-62-2	21%	1.100	4.113	-	N	N	Y	-	-	**Source of Uncertainty**
Metals, Diss	Zinc	7440-66-6	50%	662.000	33.061	2,000.00	Y	N	Y	N	0.33	Not a COPEC
SVOCs	Acenaphthene	83-32-9	0%	-	0.021	-	N	N	N	-	-	Not a COPEC
SVOCs	Acenaphthylene	208-96-8	0%	-	0.022	-	N	N	N	-	-	Not a COPEC
SVOCs	Acetophenone	98-86-2	0%	-	1.387	-	N	N	N	-	-	Not a COPEC
SVOCs	Anthracene	120-12-7	0%	-	0.036	-	N	N	N	-	-	Not a COPEC
SVOCs	Atrazine	1912-24-9	0%	-	1.699	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzaldehyde	100-52-7	0%	-	1.641	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzo(a)anthracene	56-55-3	0%	-	0.027	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzo(a)pyrene	50-32-8	0%	-	0.025	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzo(b)fluoranthene	205-99-2	0%	-	0.024	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzo(g,h,i)perylene	191-24-2	0%	-	0.031	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzo(k)fluoranthene	207-08-9	0%	-	0.025	-	N	N	N	-	-	Not a COPEC
SVOCs	1,1'-Biphenyl	92-52-4	0%	-	1.670	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Bromophenyl-phenylether	101-55-3	0%	-	1.416	-	N	N	N	-	-	Not a COPEC
SVOCs	Butylbenzylphthalate	85-68-7	0%	-	1.351	-	N	N	N	-	-	Not a COPEC
SVOCs	Caprolactam	105-60-2	0%	-	1.939	-	N	N	N	-	-	Not a COPEC
SVOCs	Carbazole	86-74-8	0%	-	1.375	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chloroaniline	106-47-8	0%	-	1.407	-	N	N	N	-	-	Not a COPEC
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	0%	-	1.411	-	N	N	N	-	-	Not a COPEC
SVOCs	Bis(2-Chloroethyl) ether	111-44-4	0%	-	1.398	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chloro-3-methylphenol	59-50-7	0%	-	1.407	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Chloronaphthalene	91-58-7	0%	-	1.686	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Chlorophenol	95-57-8	0%	-	1.201	-	N	N	N	-	-	Not a COPEC

Table C-6. COPEC Identification for Pore Water - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	0%	-	1.764	-	N	N	N	-	-	Not a COPEC
SVOCs	Chrysene	218-01-9	0%	-	0.020	-	N	N	N	-	-	Not a COPEC
SVOCs	Dibenzo(a,h)anthracene	53-70-3	0%	-	0.034	-	N	N	N	-	-	Not a COPEC
SVOCs	Dibenzofuran	132-64-9	0%	-	1.651	-	N	N	N	-	-	Not a COPEC
SVOCs	3,3'-Dichlorobenzidine	91-94-1	0%	-	1.254	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dichlorophenol	120-83-2	0%	-	1.465	-	N	N	N	-	-	Not a COPEC
SVOCs	Diethylphthalate	84-66-2	0%	-	1.543	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dimethylphenol	105-67-9	0%	-	1.259	-	N	N	N	-	-	Not a COPEC
SVOCs	Dimethylphthalate	131-11-3	0%	-	1.783	-	N	N	N	-	-	Not a COPEC
SVOCs	Di-n-butylphthalate	84-74-2	0%	-	1.521	-	N	N	N	-	-	Not a COPEC
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	0%	-	1.469	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dinitrophenol	51-28-5	0%	-	0.916	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dinitrotoluene	121-14-2	0%	-	1.504	-	N	N	N	-	-	Not a COPEC
SVOCs	2,6-Dinitrotoluene	606-20-2	0%	-	1.664	-	N	N	N	-	-	Not a COPEC
SVOCs	Di-n-octylphthalate	117-84-0	0%	-	1.290	-	N	N	N	-	-	Not a COPEC
SVOCs	1,4-Dioxane	123-91-1	0%	-	0.874	-	N	N	N	-	-	Not a COPEC
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	0%	-	1.314	-	N	N	N	-	-	Not a COPEC
SVOCs	Fluoranthene	206-44-0	0%	-	0.024	-	N	N	N	-	-	Not a COPEC
SVOCs	Fluorene	86-73-7	0%	-	0.021	-	N	N	N	-	-	Not a COPEC
SVOCs	Hexachlorobenzene	118-74-1	0%	-	1.424	-	N	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorobutadiene	87-68-3	0%	-	1.489	-	N	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	0%	-	2.707	-	N	N	N	-	-	Not a COPEC
SVOCs	Hexachloroethane	67-72-1	0%	-	1.433	-	N	N	N	-	-	Not a COPEC
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	0%	-	0.029	-	N	N	N	-	-	Not a COPEC
SVOCs	Isophorone	78-59-1	0%	-	1.336	-	N	N	N	-	-	Not a COPEC
SVOCs	1-Methylnaphthalene	90-12-0	0%	-	0.048	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Methylnaphthalene	91-57-6	36%	0.073	0.022	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	2-Methylphenol	95-48-7	0%	-	1.233	-	N	N	N	-	-	Not a COPEC
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	0%	-	0.610	-	N	N	N	-	-	Not a COPEC

Table C-6. COPEC Identification for Pore Water - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	4-Methylphenol	106-44-5	0%	-	1.649	-	N	N	N	-	-	Not a COPEC
SVOCs	Naphthalene	91-20-3	36%	0.330	0.035	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	2-Nitroaniline	88-74-4	0%	-	1.411	-	N	N	N	-	-	Not a COPEC
SVOCs	3-Nitroaniline	99-09-2	0%	-	1.368	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Nitroaniline	100-01-6	0%	-	1.670	-	N	N	N	-	-	Not a COPEC
SVOCs	Nitrobenzene	98-95-3	0%	-	1.375	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Nitrophenol	88-75-5	0%	-	1.361	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Nitrophenol	100-02-7	0%	-	1.643	-	N	N	N	-	-	Not a COPEC
SVOCs	N-Nitroso-di-n propylamine	621-64-7	0%	-	1.631	-	N	N	N	-	-	Not a COPEC
SVOCs	N-Nitrosodiphenylamine	86-30-6	0%	-	1.563	-	N	N	N	-	-	Not a COPEC
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	0%	-	1.391	-	N	N	N	-	-	Not a COPEC
SVOCs	Pentachlorophenol	87-86-5	7%	0.820	0.134	15.00	Y	Y	Y	N	0.05	**COPEC**
SVOCs	Phenanthrene	85-01-8	0%	-	0.025	-	N	N	N	-	-	Not a COPEC
SVOCs	Phenol	108-95-2	7%	12.000	1.213	2,560.00	Y	N	Y	N	0.00	Not a COPEC
SVOCs	Pyrene	129-00-0	0%	-	0.028	-	N	N	N	-	-	Not a COPEC
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	0%	-	1.731	-	N	N	N	-	-	Not a COPEC
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	0%	-	1.510	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4,5-Trichlorophenol	95-95-4	0%	-	1.434	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4,6-Trichlorophenol	88-06-2	0%	-	1.449	-	N	N	N	-	-	Not a COPEC
VOCs	Acetone	67-64-1	21%	36.000	2.400	1,700.00	Y	N	Y	N	0.02	Not a COPEC
VOCs	Benzene	71-43-2	0%	-	0.119	-	N	N	N	-	-	Not a COPEC
VOCs	Bromochloromethane	74-97-5	0%	-	0.189	-	N	N	N	-	-	Not a COPEC
VOCs	Bromodichloromethane	75-27-4	0%	-	0.165	-	N	N	N	-	-	Not a COPEC
VOCs	Bromoform	75-25-2	0%	-	0.189	-	N	N	N	-	-	Not a COPEC
VOCs	Bromomethane	74-83-9	0%	-	0.161	-	N	N	N	-	-	Not a COPEC
VOCs	2-Butanone	78-93-3	0%	-	2.386	-	N	N	N	-	-	Not a COPEC
VOCs	Carbon disulfide	75-15-0	21%	0.530	0.106	15.00	Y	N	Y	N	0.04	Not a COPEC
VOCs	Carbon tetrachloride	56-23-5	0%	-	0.158	-	N	N	N	-	-	Not a COPEC
VOCs	Chlorobenzene	108-90-7	0%	-	0.098	-	N	N	N	-	-	Not a COPEC
VOCs	Chloroethane	75-00-3	0%	-	0.164	-	N	N	N	-	-	Not a COPEC

Table C-6. COPEC Identification for Pore Water - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
VOCs	Chloroform	67-66-3	7%	1.509	0.084	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	Chloromethane	74-87-3	0%	-	0.177	-	N	N	N	-	-	Not a COPEC
VOCs	Cyclohexane	110-82-7	0%	-	0.189	-	N	N	N	-	-	Not a COPEC
VOCs	Dibromochloromethane	124-48-1	0%	-	0.170	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	0%	-	0.316	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromoethane	106-93-4	0%	-	0.137	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichlorobenzene	95-50-1	0%	-	0.132	-	N	N	N	-	-	Not a COPEC
VOCs	1,3-Dichlorobenzene	541-73-1	7%	0.190	0.124	22.00	Y	N	Y	N	0.01	Not a COPEC
VOCs	1,4-Dichlorobenzene	106-46-7	0%	-	0.136	-	N	N	N	-	-	Not a COPEC
VOCs	Dichlorodifluoromethane	75-71-8	0%	-	0.166	-	N	N	N	-	-	Not a COPEC
VOCs	1,1-Dichloroethane	75-34-3	0%	-	0.091	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloroethane	107-06-2	0%	-	0.082	-	N	N	N	-	-	Not a COPEC
VOCs	1,1-Dichloroethene	75-35-4	0%	-	0.148	-	N	N	N	-	-	Not a COPEC
VOCs	cis-1,2-Dichloroethene	156-59-2	7%	0.780	0.159	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	trans-1,2-Dichloroethene	156-60-5	0%	-	0.143	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloropropane	78-87-5	0%	-	0.146	-	N	N	N	-	-	Not a COPEC
VOCs	cis-1,3-Dichloropropene	10061-01-5	0%	-	0.167	-	N	N	N	-	-	Not a COPEC
VOCs	trans-1,3-Dichloropropene	10061-02-6	0%	-	0.128	-	N	N	N	-	-	Not a COPEC
VOCs	Ethylbenzene	100-41-4	0%	-	0.094	-	N	N	N	-	-	Not a COPEC
VOCs	2-Hexanone	591-78-6	0%	-	1.579	-	N	N	N	-	-	Not a COPEC
VOCs	Isopropylbenzene	98-82-8	0%	-	0.091	-	N	N	N	-	-	Not a COPEC
VOCs	Methyl acetate	79-20-9	0%	-	0.246	-	N	N	N	-	-	Not a COPEC
VOCs	Methyl tert-butyl ether	1634-04-4	0%	-	0.131	-	N	N	N	-	-	Not a COPEC
VOCs	Methylene chloride	75-09-2	0%	-	0.202	-	N	N	N	-	-	Not a COPEC
VOCs	Methylcyclohexane	108-87-2	0%	-	0.186	-	N	N	N	-	-	Not a COPEC
VOCs	4-Methyl-2-pentanone	108-10-1	0%	-	1.607	-	N	N	N	-	-	Not a COPEC
VOCs	Styrene	100-42-5	0%	-	0.094	-	N	N	N	-	-	Not a COPEC
VOCs	Tetrachloroethene	127-18-4	0%	-	0.122	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	0%	-	0.216	-	N	N	N	-	-	Not a COPEC
VOCs	Toluene	108-88-3	14%	0.530	0.115	62.00	Y	N	Y	N	0.01	Not a COPEC

Table C-6. COPEC Identification for Pore Water - Onsite Ravines

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (µg/L)	Average MDL (µg/L)	Benchmark (µg/L)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
VOCs	1,1,1-Trichloroethane	71-55-6	0%	-	0.157	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2-Trichloroethane	79-00-5	0%	-	0.225	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichlorobenzene	87-61-6	0%	-	0.149	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trichlorobenzene	120-82-1	0%	-	0.144	-	N	N	N	-	-	Not a COPEC
VOCs	Trichloroethene	79-01-6	7%	0.086	0.117	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	Trichlorofluoromethane	75-69-4	0%	-	0.108	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichloropropane	96-18-4	0%	-	0.410	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	0%	-	0.145	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trimethylbenzene	95-63-6	0%	-	0.260	-	N	N	N	-	-	Not a COPEC
VOCs	1,3,5-Trimethylbenzene	108-67-8	0%	-	0.160	-	N	N	N	-	-	Not a COPEC
VOCs	Vinyl chloride	75-01-4	0%	-	0.145	-	N	N	N	-	-	Not a COPEC
VOCs	m, p-Xylene	179601-23-1	0%	-	0.088	-	N	N	N	-	-	Not a COPEC
VOCs	o-Xylene	95-47-6	0%	-	0.086	-	N	N	N	-	-	Not a COPEC

Notes:

COPEC: Contaminants of potential ecological concern

MDL: Method detection limit

µg/L: Microgram per liter

SVOCs: Semi volatile organic compounds

SWA: State wildlife area

VOCs: Volatile organic compounds

Table C-7. COPEC Identification for Surficial Soil

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
Metals	Aluminum	7429-90-5	100%	6,900.000	5.400	-	N	N	Y	-	-	**Source of Uncertainty**
Metals	Antimony	7440-36-0	93%	19.500	0.067	0.27	Y	N	Y	Y	72	**COPEC**
Metals	Arsenic	7440-38-2	100%	1,180.000	0.064	6.8	Y	N	Y	Y	174	**COPEC**
Metals	Barium	7440-39-3	100%	1,540.000	0.301	110	Y	N	Y	Y	14	**COPEC**
Metals	Beryllium	7440-41-7	91%	3.300	0.045	2.5	Y	N	Y	Y	1	**COPEC**
Metals	Cadmium	7440-43-9	100%	69.800	0.061	0.36	Y	N	Y	Y	194	**COPEC**
Metals	Chromium	7440-47-3	100%	390.000	0.093	0.4	Y	N	Y	Y	975	**COPEC**
Metals	Chromium, Hexavalent	18540-29-9	79%	3.270	0.012	0.34	Y	N	Y	Y	10	**COPEC**
Metals	Cobalt	7440-48-4	100%	15.000	0.036	13	Y	N	Y	Y	1	**COPEC**
Metals	Copper	7440-50-8	100%	2,130.000	0.190	28	Y	N	Y	Y	76	**COPEC**
Metals	Iron	7439-89-6	100%	18,000.000	1.400	-	N	N	Y	-	-	**Source of Uncertainty**
Metals	Lead	7439-92-1	100%	9,290.000	0.314	11	Y	N	Y	Y	845	**COPEC**
Metals	Manganese	7439-96-5	100%	8,630.000	0.401	220	Y	N	Y	Y	39	**COPEC**
Metals	Mercury	7439-97-6	95%	11.500	0.020	0.013	Y	Y	Y	Y	885	**COPEC**
Metals	Nickel	7440-02-0	100%	5,300.000	0.069	38	Y	N	Y	Y	139	**COPEC**
Metals	Selenium	7782-49-2	91%	11.000	0.373	0.52	Y	Y	Y	Y	21	**COPEC**
Metals	Silver	7440-22-4	96%	36.700	0.038	4.2	Y	N	Y	Y	9	**COPEC**
Metals	Thallium	7440-28-0	90%	1.600	0.047	0.05	Y	N	Y	Y	32	**COPEC**
Metals	Vanadium	7440-62-2	100%	55.000	0.175	7.8	Y	N	Y	Y	7	**COPEC**
Metals	Zinc	7440-66-6	100%	11,900.000	1.290	46	Y	N	Y	Y	259	**COPEC**
SVOCs	Low Molecular Weight PAHs	PAH_Low	100%	2.479	0.008	29	Y	N	Y	N	0	Not a COPEC
SVOCs	Acenaphthene	83-32-9	90%	0.260	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Acenaphthylene	208-96-8	98%	0.120	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Anthracene	120-12-7	97%	0.300	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Fluorene	86-73-7	76%	0.200	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	1-Methylnaphthalene	90-12-0	68%	0.011	0.002	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	2-Methylnaphthalene	91-57-6	98%	0.410	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Naphthalene	91-20-3	93%	0.160	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Phenanthrene	85-01-8	100%	1.400	0.002	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	High Molecular Weight PAHs	PAH_High	100%	12.014	0.024	1.1	Y	N	Y	Y	11	**COPEC**
SVOCs	Benzo(a)anthracene	56-55-3	100%	1.500	0.002	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Benzo(a)pyrene	50-32-8	100%	1.200	0.002	-	N	N	Y	-	-	**Source of Uncertainty**

Table C-7. COPEC Identification for Surficial Soil

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	Benzo(b)fluoranthene	205-99-2	100%	2.000	0.003	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Benzo(g,h,i)perylene	191-24-2	100%	0.430	0.003	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Benzo(k)fluoranthene	207-08-9	100%	0.640	0.002	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Chrysene	218-01-9	100%	1.800	0.002	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Dibenzo(a,h)anthracene	53-70-3	21%	0.034	0.002	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Fluoranthene	206-44-0	100%	2.300	0.002	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	100%	0.380	0.003	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Pyrene	129-00-0	100%	1.800	0.002	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	Acetophenone	98-86-2	1%	0.092	0.028	-	N	N	N	-	-	Not a COPEC
SVOCs	Atrazine	1912-24-9	0%	-	0.035	-	N	N	N	-	-	Not a COPEC
SVOCs	Benzaldehyde	100-52-7	2%	0.021	0.031	-	N	N	N	-	-	Not a COPEC
SVOCs	1,1'-Biphenyl	92-52-4	2%	0.450	0.038	0.2	Y	N	N	Y	-	Not a COPEC
SVOCs	4-Bromophenyl-phenylether	101-55-3	0%	-	0.037	-	N	N	N	-	-	Not a COPEC
SVOCs	Butylbenzylphthalate	85-68-7	5%	0.039	0.034	0.59	Y	N	N	N	-	Not a COPEC
SVOCs	Caprolactam	105-60-2	0%	-	0.038	-	N	N	N	-	-	Not a COPEC
SVOCs	Carbazole	86-74-8	5%	0.142	0.034	-	N	N	Y	-	-	**Source of Uncertainty**
SVOCs	4-Chloroaniline	106-47-8	0%	-	0.032	-	N	N	N	-	-	Not a COPEC
SVOCs	bis(2-Chloroethoxy)methane	111-91-1	0%	-	0.033	-	N	N	N	-	-	Not a COPEC
SVOCs	Bis(2-Chloroethyl)ether	111-44-4	0%	-	0.031	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chloro-3-methylphenol	59-50-7	0%	-	0.033	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Chloronaphthalene	91-58-7	0%	-	0.037	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Chlorophenol	95-57-8	0%	-	0.033	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Chlorophenyl-phenyl ether	7005-72-3	0%	-	0.033	-	N	N	N	-	-	Not a COPEC
SVOCs	Dibenzofuran	132-64-9	6%	0.140	0.037	0.15	Y	N	Y	N	1	Not a COPEC
SVOCs	3,3'-Dichlorobenzidine	91-94-1	0%	-	0.032	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dichlorophenol	120-83-2	0%	-	0.035	-	N	N	N	-	-	Not a COPEC
SVOCs	Diethylphthalate	84-66-2	0%	-	0.032	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dimethylphenol	105-67-9	0%	-	0.037	-	N	N	N	-	-	Not a COPEC
SVOCs	Dimethylphthalate	131-11-3	0%	-	0.036	-	N	N	N	-	-	Not a COPEC
SVOCs	Di-n-butylphthalate	84-74-2	1%	0.036	0.033	0.011	Y	N	N	Y	-	**Source of Uncertainty**
SVOCs	4,6-Dinitro-2-methylphenol	534-52-1	0%	-	0.044	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4-Dinitrophenol	51-28-5	0%	-	0.032	-	N	N	N	-	-	Not a COPEC

Table C-7. COPEC Identification for Surficial Soil

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
SVOCs	2,4-Dinitrotoluene	121-14-2	0%	-	0.037	-	N	N	N	-	-	Not a COPEC
SVOCs	2,6-Dinitrotoluene	606-20-2	0%	-	0.034	-	N	N	N	-	-	Not a COPEC
SVOCs	Di-n-octylphthalate	117-84-0	0%	-	0.033	0.91	Y	N	N	-	-	Not a COPEC
SVOCs	1,4-Dioxane	123-91-1	0%	-	0.015	-	N	N	N	-	-	Not a COPEC
SVOCs	bis(2-Ethylhexyl)phthalate	117-81-7	36%	0.990	0.033	0.02	Y	N	Y	Y	50	**COPEC**
SVOCs	Hexachlorobenzene	118-74-1	0%	-	0.037	-	N	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorobutadiene	87-68-3	0%	-	0.035	-	N	Y	N	-	-	Not a COPEC
SVOCs	Hexachlorocyclo-pentadiene	77-47-4	0%	-	0.053	-	N	N	N	-	-	Not a COPEC
SVOCs	Hexachloroethane	67-72-1	0%	-	0.029	-	N	N	N	-	-	Not a COPEC
SVOCs	Isophorone	78-59-1	0%	-	0.031	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Methylphenol	95-48-7	0%	-	0.032	-	N	N	N	-	-	Not a COPEC
SVOCs	3-Methylphenol + 4-Methylphenol	106-44-5	0%	-	0.027	0.69	Y	N	N	-	-	Not a COPEC
SVOCs	4-Methylphenol	106-44-5	0%	-	0.048	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Nitroaniline	88-74-4	0%	-	0.039	-	N	N	N	-	-	Not a COPEC
SVOCs	3-Nitroaniline	99-09-2	0%	-	0.029	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Nitroaniline	100-01-6	0%	-	0.034	-	N	N	N	-	-	Not a COPEC
SVOCs	Nitrobenzene	98-95-3	0%	-	0.032	-	N	N	N	-	-	Not a COPEC
SVOCs	2-Nitrophenol	88-75-5	0%	-	0.037	-	N	N	N	-	-	Not a COPEC
SVOCs	4-Nitrophenol	100-02-7	0%	-	0.040	-	N	N	N	-	-	Not a COPEC
SVOCs	N-Nitroso-di-n propylamine	621-64-7	0%	-	0.032	-	N	N	N	-	-	Not a COPEC
SVOCs	N-Nitrosodiphenylamine	86-30-6	2%	0.021	0.036	0.545	Y	N	N	N	-	Not a COPEC
SVOCs	2,2'-Oxybis(1-chloropropane)	108-60-1	0%	-	0.031	-	N	N	N	-	-	Not a COPEC
SVOCs	Pentachlorophenol	87-86-5	26%	0.032	0.005	2.1	Y	Y	Y	N	0	**COPEC**
SVOCs	Phenol	108-95-2	0%	-	0.034	-	N	N	N	-	-	Not a COPEC
SVOCs	1,2,4,5-Tetrachlorobenzene	95-94-3	0%	-	0.037	-	N	N	N	-	-	Not a COPEC
SVOCs	2,3,4,6-Tetrachlorophenol	58-90-2	0%	-	0.036	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4,5-Trichlorophenol	95-95-4	0%	-	0.035	-	N	N	N	-	-	Not a COPEC
SVOCs	2,4,6-Trichlorophenol	88-06-2	0%	-	0.040	-	N	N	N	-	-	Not a COPEC
VOCs	Acetone	67-64-1	38%	0.170	0.047	0.04	Y	N	Y	Y	4	**COPEC**
VOCs	Benzene	71-43-2	0%	-	0.007	0.12	Y	N	N	-	-	Not a COPEC
VOCs	Bromochloromethane	74-97-5	0%	-	0.006	-	N	N	N	-	-	Not a COPEC
VOCs	Bromodichloromethane	75-27-4	0%	-	0.005	-	N	N	N	-	-	Not a COPEC

Table C-7. COPEC Identification for Surficial Soil

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
VOCs	Bromoform	75-25-2	0%	-	0.005	0.07	Y	N	N	-	-	Not a COPEC
VOCs	Bromomethane	74-83-9	0%	-	0.013	0.002	Y	N	N	-	-	Not a COPEC
VOCs	2-Butanone	78-93-3	6%	0.033	0.030	1	Y	N	Y	N	0	Not a COPEC
VOCs	Carbon disulfide	75-15-0	2%	0.004	0.006	0.005	Y	N	N	N	-	**Source of Uncertainty**
VOCs	Carbon tetrachloride	56-23-5	0%	-	0.007	0.05	Y	N	N	-	-	Not a COPEC
VOCs	Chlorobenzene	108-90-7	0%	-	0.005	2.4	Y	N	N	-	-	Not a COPEC
VOCs	Chloroethane	75-00-3	0%	-	0.009	-	N	N	N	-	-	Not a COPEC
VOCs	Chloroform	67-66-3	1%	0.006	0.006	0.05	Y	N	N	N	-	Not a COPEC
VOCs	Chloromethane	74-87-3	0%	-	0.007	-	N	N	N	-	-	Not a COPEC
VOCs	Cyclohexane	110-82-7	0%	-	0.010	-	N	N	N	-	-	Not a COPEC
VOCs	Dibromochloromethane	124-48-1	0%	-	0.006	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromo-3-chloropropane	96-12-8	0%	-	0.008	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dibromoethane	106-93-4	0%	-	0.005	-	N	N	N	-	-	Not a COPEC
VOCs	1,2-Dichlorobenzene	95-50-1	0%	-	0.006	0.09	Y	N	N	-	-	Not a COPEC
VOCs	1,3-Dichlorobenzene	541-73-1	0%	-	0.006	-	N	N	N	-	-	Not a COPEC
VOCs	1,4-Dichlorobenzene	106-46-7	0%	-	0.005	0.89	Y	N	N	-	-	Not a COPEC
VOCs	Dichlorodifluoromethane	75-71-8	0%	-	0.010	-	N	N	N	-	-	Not a COPEC
VOCs	1,1-Dichloroethane	75-34-3	0%	-	0.006	0.14	Y	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloroethane	107-06-2	0%	-	0.005	0.4	Y	N	N	-	-	Not a COPEC
VOCs	1,1-Dichloroethene	75-35-4	0%	-	0.008	0.04	Y	N	N	-	-	Not a COPEC
VOCs	cis-1,2-Dichloroethene	156-59-2	1%	0.031	0.006	0.04	Y	N	N	N	-	Not a COPEC
VOCs	trans-1,2-Dichloroethene	156-60-5	0%	-	0.006	0.04	Y	N	N	-	-	Not a COPEC
VOCs	1,2-Dichloropropane	78-87-5	0%	-	0.006	0.28	Y	N	N	-	-	Not a COPEC
VOCs	cis-1,3-Dichloropropene	10061-01-5	0%	-	0.006	-	N	N	N	-	-	Not a COPEC
VOCs	trans-1,3-Dichloropropene	10061-02-6	0%	-	0.009	-	N	N	N	-	-	Not a COPEC
VOCs	Ethylbenzene	100-41-4	1%	0.750	0.006	0.27	Y	N	N	Y	-	Not a COPEC
VOCs	2-Hexanone	591-78-6	9%	0.019	0.030	0.36	Y	N	Y	N	0	Not a COPEC
VOCs	Isopropylbenzene	98-82-8	1%	0.800	0.005	-	N	N	N	-	-	Not a COPEC
VOCs	Methyl acetate	79-20-9	6%	0.004	0.007	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	Methyl tert-butyl ether	1634-04-4	0%	-	0.006	-	N	N	N	-	-	Not a COPEC
VOCs	Methylene chloride	75-09-2	22%	0.014	0.006	2.6	Y	N	Y	N	0	Not a COPEC
VOCs	Methylcyclohexane	108-87-2	1%	0.770	0.011	-	N	N	N	-	-	Not a COPEC

Table C-7. COPEC Identification for Surficial Soil

Chemical Group	Analyte	CAS Number	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average MDL (mg/kg)	Benchmark (mg/kg)	Available Benchmark	Bioacc.	Detect >= 5%	Max Detect > Benchmark	Hazard Quotient	COPEC Identification
VOCs	4-Methyl-2-pentanone	108-10-1	0%	-	0.010	9.7	Y	N	N	-	-	Not a COPEC
VOCs	Styrene	100-42-5	0%	-	0.005	1.2	Y	N	N	-	-	Not a COPEC
VOCs	Tetrachloroethene	127-18-4	0%	-	0.006	0.06	Y	N	N	-	-	Not a COPEC
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	0%	-	0.006	0.127	Y	N	N	-	-	Not a COPEC
VOCs	Toluene	108-88-3	5%	0.420	0.006	0.15	Y	N	Y	Y	3	**COPEC**
VOCs	1,1,1-Trichloroethane	71-55-6	0%	-	0.005	0.04	Y	N	N	-	-	Not a COPEC
VOCs	1,1,2-Trichloroethane	79-00-5	0%	-	0.005	0.32	Y	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichlorobenzene	87-61-6	0%	-	0.006	20	Y	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trichlorobenzene	120-82-1	0%	-	0.006	0.27	Y	N	N	-	-	Not a COPEC
VOCs	Trichloroethene	79-01-6	0%	-	0.005	0.06	Y	N	N	-	-	Not a COPEC
VOCs	Trichlorofluoromethane	75-69-4	0%	-	0.008	52	Y	N	N	-	-	Not a COPEC
VOCs	1,2,3-Trichloropropane	96-18-4	0%	-	0.003	-	N	N	N	-	-	Not a COPEC
VOCs	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	0%	-	0.012	-	N	N	N	-	-	Not a COPEC
VOCs	1,2,4-Trimethylbenzene	95-63-6	5%	18.000	0.001	-	N	N	Y	-	-	**Source of Uncertainty**
VOCs	1,3,5-Trimethylbenzene	108-67-8	3%	24.000	0.001	-	N	N	N	-	-	Not a COPEC
VOCs	Vinyl chloride	75-01-4	1%	0.039	0.007	0.03	Y	N	N	Y	-	Not a COPEC
VOCs	m,p-Xylene	179601-23-1	2%	4.800	0.005	-	N	N	N	-	-	Not a COPEC
VOCs	o-Xylene	95-47-6	2%	2.400	0.005	0.1	Y	N	N	Y	-	Not a COPEC

Notes:

COPEC: Contaminants of potential ecological concern

MDL: Method detection limit

mg/kg: Milligram per kilogram

SVOCs: Semi volatile organic compounds

SWA: State wildlife area

VOCs: Volatile organic compounds